БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

А. И. Терешков

MACROECONOMIC ANALYSIS AND POLICY

МАКРОЭКОНОМИКА: АНАЛИЗ И ПОЛИТИКА

Рекомендовано
Учебно-методическим объединением
по экономическому образованию
в качестве пособия для студентов углубленного
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and Innovative Management of Enterprises» and profiling
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кандидат политических наук *А. О. Буева*

Терешков, А. И.

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Рассмотрены важнейшие механизмы функционирования и развития национальной экономики, причины и последствия макроэкономических проблем (безработица, инфляция, цикличность). Анализируются методы государственного регулирования и развития национальной экономики.

Для студентов углубленного высшего образования, обучающихся по специальностям 7-06-0411-02 «Финансы, налогообложение и кредит» и 7-06-0311-01 «Экономика».

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CONTENTS

FOREWORD

Macroeconomic analysis and policy is a study of the economy as a whole, the structure of its relations between large aggregates that make up the national economic organism. This is an analysis of the total volume of production, the equilibrium of the national economy, unemployment and inflation rates, etc.

This textbook outlines the key issues of macroeconomic theory: its methodological principles and theoretical approaches, features of the subject and methodology; sectoral and sectoral structure of the national economy; the basic principles of calculation and the relationship of macroeconomic indicators included in the system of national accounts; the essence and structure of national wealth, its features, etc.

This textbook is intended for foreign students of the specialties "Finance, taxation and credits Profiling "Finance in Digital Economy", "Economics" Profiling "HR Analytics" Profiling "Economics and Innovative Management of Enterprises", which allows you to get answers to many economic problems of modern society.

The main goal of the discipline: the formation of theoretical knowledge of modern macroeconomic theories and macroeconomic models, deepening the understanding of the fundamental foundations and the most important mechanisms for the functioning of the national economy as a whole; to allow future specialists to make the most effective management decisions, taking into account the macroeconomic policy implemented in the country.

The academic discipline "Macroeconomic analysis and policy" belongs to the "Theoretical Economics" State Component module.

The main objectives of this academic discipline:

1) study of the basic laws (principles) of the functioning of the national economy as a whole, the causes and consequences of the main macroeconomic problems;

2) study of the possibilities and consequences of macroeconomic regulation of the national economy;

3) providing a modern methodological and theoretical basis for further practical activities;

4) improving the skills of scientific research in the field of macroeconomic policy.

As a result of mastering the academic discipline, the student should be

• ***able to:*** analyze the features of macroeconomic policy under various initial conditions for the functioning of the economy, develop macroeconomic policy measures;

• ***possess:*** the skills of macroeconomic analysis, modeling and forecasting using modern tools.

The textbook is compiled in accordance with the program of the discipline "Macroeconomic Analysis and Policy" (https://elib.bsu.by/handle/123456789/286164) and is intended for foreigners and is intended for sections where the theory is presented; practical part in the form of plans for seminars; auxiliary material (questions for the exam, discipline program); questions, tests, tasks are proposed as a control of knowledge by sections. There are also lists of references for all sections.

The methodology for working with this publication suggests.

The use of "Macroeconomic analysis and policy" in the educational process will increase its effectiveness.

1. INTRODUCTION TO MACROECONOMICS

Basic concepts
Macroeconomics. Macroeconomic models. General economic equilibrium. GDP. GNP. PMI. ND. Personal income. Real income. Savings. Nominal GDP. Real GDP. GDP Deflator. Laspeyres Index. Paasche Index. Fischer index. Basic macroeconomic identity. Nominal and real indicators. Price indices.

1.1. THE EMERGENCE OF MACROECONOMICS AS A BRANCH OF ECONOMIC SCIENCE. THE SUBJECT OF MACROECONOMICS

As an independent direction of economic theory, macroeconomics was formed in the 30s of the XX century. Its emergence was caused by profound socio-economic changes that occurred in Western countries in connection with the Great Depression and the general crisis (1929–1933). The classical model of economics, which claimed that the free market is able to regulate itself with the help of prices, proved unable to explain the situation in the economy. Moreover, it could not offer effective measures to overcome the crisis.

As a response to the urgent problems that life has put before economists, a model of economic regulation has appeared, proposed by the English economist D. Keynes. In the book "The General Theory of Employment, Interest and Money", Keynes criticized the classical notions of market self-regulation, that production itself creates consumption, and that the market does not need any intervention from the state. On the contrary, he argued that only with the help of state regulation it is possible to get out of the crisis. The main idea of his theory is that in order to increase the real volume of production and eliminate its decline, it is necessary to expand government spending and reduce taxes. Such expenditures increase aggregate demand and thus contribute to the recovery of production and the revival of the economy. J. Keynes laid the foundations of macroeconomics, defined its basic concepts and identified the most important patterns. Since the publication of his book, the economic situation in countries with developed market economies has changed.

After the end of World War II, Keynesians predicted a deep decline in production, but it did not come. But inflationary processes have intensified in different countries, which have worsened since the early 70s of the XX century. In this regard, criticism of the Keynesian model began. The monetarist model of M. Friedman (Chicago School) has become increasingly popular.

Monetarists oppose government interference in market regulation. However, difficulties in the economy of Western countries in the early 80s of the XX century due to rising inflation and a decline in production (stagflation) caused a critical attitude to the monetarist model. Thus, the main difference between Keynesians and monetarists are the issues of market regulation. Keynes and his followers consider such regulation of the economy by the state not only possible, but also necessary. Monetarists reject such interference, arguing that the market mechanism will come into balance on its own and organize itself. However, it should be recognized that the market system is not able to regulate itself, it cannot achieve an equilibrium between supply and demand. This balance can be achieved through external intervention and regulation.

Macroeconomics course, as a subject, is read after studying economic theory and microeconomics. Economic theory is an introductory discipline. It outlines the basic concepts and relationships. In microeconomics, various issues are studied, for example, pricing in the markets for goods or factors of production. In particular, it explains the change in relative prices, the prices of some goods in relation to the prices of other goods. However, it should be noted that there is not only a change in relative prices (say, oil prices or apple prices), but also a change in their general level, i.e. inflation, which is not part of the task of microeconomics and is one of the main issues of macroeconomics. In microeconomics, labor is considered as one of the main factors of production, the subject of study is the balance in individual labor markets, taking into account the profession, qualifications, specialization, etc. Microeconomics, dose not pay attention to the aggregate value of employment in the economy or the unemployment rate; when considering the problem of equilibrium, attention is paid to the problem of the optimal volume of production in a separate market, and not on the scale of the entire national economy. These questions will be studied in the macroeconomics course. Thus, the subject of macroeconomic theory is the study of macroeconomic phenomena and processes that are relevant to the national economy, considered as a whole, and thus should receive a macroeconomic explanation. Macroeconomics studies the behavior of the economy as a whole: changes in production and employment in the long term (economic growth), their short-term fluctuations that form business cycles, problems of inflation, unemployment. Macroeconomic tries to explain why the inflation occurs and how to deal with it, the causes and consequences of unemployment, trends and growth factors of the national economy. At the same time, macroeconomics operates with generalizing indicators (total volume of production without dividing it into separate types of products, the household as a whole, the firm, the average

price level, etc.). There are different definitions of the subject of this science. Here are two of the most successful ones. Macroeconomics is a branch of economic science that studies the functioning of the economy as a whole in terms of ensuring conditions for sustainable economic growth, full employment of resources and minimization of inflation. Macroeconomics is the science of aggregate behavior in the economy.

The main object of macroeconomics is the national economy, which allows you to understand the differences between business entities. It should be noted, that some macroeconomic issues relate to the economy of the country, same time some of them may have implications for a number of countries (for example, global oil or financial crises). In this case, we can talk about global macroeconomic analysis.

1.2. THE METHOD OF MACROECONOMICS. MACROECONOMIC MODEL

Macroeconomics uses the entire set of general scientific methods of scientific research.

The application of the dialectical method involves considering the phenomenon under study in development, in the transition from a simple to more complex forms, identifying its internal contradictions as a source of development.

The dialectical method means the unity of quantitative and qualitative analyses, the development of phenomena and processes, and the overcoming of contradictions. Economic phenomena are considered in the process of their emergence, origin, maturity and death. Any phenomenon is investigated from the positive and negative sides, with the allocation of cause and effect, correlation dependence. This applies to all problems of macroeconomics – the formation of a market national economy, the movement of aggregate demand and aggregate supply, cyclical development, inflation and unemployment, various types and methods of monetary and tax regulation, social policy.

The method of scientific abstraction allows to find out the essential properties, signs of the studied phenomena and processes and generalize them in the form of economic concepts, to identify stable cause-and-effect relationships between the studied phenomena and processes in order to formulate them in the form of objective laws.

Scientific abstraction is manifested in the creation of an economic theory (theories) of individual processes, in economic categories and laws, principles of the functioning of the national economy. For example, if you will study the

theory of the system of national accounts as a set of concepts that explain the creation, distribution, redistribution and use of the gross national product and national income. The methodological role in macroeconomics is played by the theory of general equilibrium of markets for goods, resources, capital and securities. There are scientific theories on individual processes of development and regulation of the national economy. You can study also the theory of cyclical economic development; money market, money circulation and inflation; employment and unemployment; budgeting and taxation; credit system and monetary regulation; wages and total income of the population. Theories are formed on the basis of the use of economic categories, laws and principles. One of the laws of macroeconomics is the objective necessity of using the national income for consumption and savings (accumulation). Money circulation is regulated in accordance with the law, which determines the total amount of money necessary for circulation. Distribution relations in terms of the direction of income are regulated by the distribution of labor and capital (property). Macroeconomics also uses the general laws of supply and demand, which, taking into account the characteristics of the national economy, act as the laws of aggregate demand and aggregate supply. The general economic laws of cost and productivity growth also are applying as well, since microeconomics is an element of the national economy.

With the help of the ***system method***, it is possible to build in a certain hierarchical order the studied phenomena and processes, the elements of the economic model, to consider the influence of internal patterns and external conditions for the functioning of the model.

The system method determines the relationship and subordination of individual components of the national economy and its structure. This method assumes, for example, that in the system of forms of the gross product, the initial and determining form is the gross domestic product. All other forms of product are formed on its basis (national product, net product, national income). In the "disposable income" system, consumption and savings are equivalent components, but the initial and determining part is consumption, which directly forms the goals of social development. A systematic approach requires a subordinate sequence in disclosing the factors of aggregate demand and aggregate supply, highlighting of the main causes and conditions of macroeconomic instability, budget deficit, and differentiation of household incomes.

Macroeconomics, in addition to general scientific ones, uses some specific methods of cognition of economic reality, from which ***aggregation*** and ***the construction of macroeconomic models*** should be distinguished.

Aggregation is necessary not only in theory, but also in practice (when collecting and processing statistical data, which form the basis for empirical

analysis). An aggregate indicator is an abstraction that allows you to combine into a whole a set of phenomena that have related individual characteristics. Macroeconomics considers aggregate variables (total output, consumption, investment, exports and imports, price levels, and so on) and aggregate markets (goods market, labor market, and capital asset market).

The description of the economy as a whole leads to the construction of ***macroeconomic models*** – formalized (logically, graphically and algebraically) descriptions of various economic phenomena and processes in order to identify functional relationships between them. In any model, there are certain prerequisites and two types of variables are used: *exogenous* and *endogenous*.

Macroeconomic models use four types of *functional relationships* between endogenous (internal) and exogenous (external) economic variables:

a) *definitional* connections (definition – definition) reflect dependencies that correspond to the verbal description of economic phenomena. For example, the indicator "aggregate demand in the commodity market" means the total demand of households, the investment demand of firms, the demand of the state and abroad:

$$Y = C + I + G + X_n;$$

b) *behavioral* connections show the preferences of economic entities that have developed in society. For example, the pattern of decision-making by firms on the volume of investments from the interest rate can be represented as

$$I = I(r),\ I' < 0;$$

c) *technological* links reflect technological dependencies in the economy. For example, the production function describes the dependence of the volume of production on the volume of production factors used for a given technology:

$$Y = f(K, L, M),$$

where K, L, M are capital, labor and natural resources acting as factors of production;

d) *institutional* links reflect the dependence between state institutions that regulate economic activity and economic indicators. For example, the amount of tax revenues to the budget T depends on the amount of income of economic entities Y and on the tax rate t and is expressed by the function

$$T = tY.$$

Macroeconomic models can be static, i.e., describing the economy in a state of equilibrium, and dynamic, i.e., describing the change in the state of the economy over time (for example, models of economic growth).

Macroeconomic models, as a rule, are open, since they involve interaction with the external environment.

The models use double abstractions: first, economic concepts are introduced that describe the behavior of a large group of subjects, then they are translated into equations, i.e., mathematical formulas are applied that form a macroeconomic model.

The causality between macroeconomic variables poses two related problems:

1. Relationships between micro- and macroeconomic behaviors. Microeconomic foundations of macroeconomic relations – the direction of research, consistent with the principle of optimizing the activity of the subject. For example, determining the level of national unemployment between groups working for hire;

2. Determination of exogenous variables corresponding to the values expected by the subjects. This aspect – the invariance of the model – is based on macroeconomic foundations. That is, the choice of economic policy should not change the behavior of the subject, which formed the basis of macroeconomic relations and determined the initial economic parameters.

Any model is a simplified, abstract reflection of reality, since all the variety of specific details cannot be simultaneously taken into account when conducting a study. Therefore, no macroeconomic model is absolute, comprehensive, nor dosen't give the only correct answers to a specific countries in a specific period of time. However, with the help of such generalized models, a set of alternative ways to control of the dynamics of employment levels, production, inflation, investment, consumption, interest rates, exchange rates and other internal economic variables is determined, the probabilistic values of which are established as a result of solving the model. The external variables, the value of which is determined outside the model, are the main instruments of the government's fiscal policy and the monetary policy of the National Bank – changes in government spending, taxes, and money supply.

The multivariance of the methods for solving economic problems provided by models, makes it possible to achieve the necessary alternativeness and flexibility of macroeconomic policy. The use of macroeconomic models makes it possible to optimize the combination of fiscal, monetary, foreign exchange and foreign trade policy instruments, to successfully coordinate the measures of the government and the National Bank to manage cyclical fluctuations in the economy. Such generalized macroeconomic models as circular flow model, *AD–AS*, *IS–LM*, Phillips, Laffer curves, Solow model, etc., are general tools for macroeconomic analysis and do not have any national specifics. The values of empirical coefficients and specific forms of functional dependencies, between economic variables in different countries can be specific. The evaluation of any macroeconomic model should be given not by the criterion of its momentary "suitability" or "unsuitability" for

the economy of a particular country, including the Republic of Belarus, but by the criterion of its usefulness in the process of understanding economic dynamics and managing its indicators. The objective difficulty is to ensure that the prerequisites for constructing the model are sufficient in terms of the set goal and to avoid erroneous conclusions for macroeconomic policy. Same time, the model should be realistic enough, not too complicated, because of the simplicity of the model is one of the most important requirements in terms of the possibilities of its use in the research process. However, excessive simplification of the model can lead to the exclusion of significant factors from the analysis, as a result of which the conclusions will turn out to be incorrect. Therefore, the most difficult moment in building any model is to determine the range of factors that are essential for the macroeconomic analysis of a particular problem.

1.3. THE ECONOMIC CIRCUIT. GENERAL CONDITIONS OF MACROECONOMIC EQUILIBRIUM

Macroeconomic, *or general economic*, *equilibrium* is such a state of the national economy when there is an equilibrium between aggregate demand and aggregate supply. Economists distinguish the types of macroeconomic equilibrium. This is equality between resources and their use, production and consumption, material and financial flows, savings and investments. But the main condition is the balance between aggregate demand and aggregate supply, without which the market economy cannot develop.

Some of the economists believe that the general economic equilibrium is not typical for a market system. However, it should be noted that the general equilibrium is never complete and ideal. This is just a positive macroeconomic dynamics from the worst to the best ratio of aggregate supply and aggregate demand. Indicators of this trend are indicators of GDP growth, NI and other macroeconomic indicators.

Economic equilibrium is the optimal state of micro- and macroeconomics. For microeconomics, equilibrium means setting a price at which the quantity demanded equals the quantity supplied. Such a price is called the equilibrium price, and the microeconomic equilibrium itself is a partial equilibrium.

Macroeconomics, equilibrium means equality between aggregate demand and aggregate supply. At the same time, for macroeconomics, such a state is optimal when aggregate demand coincides with aggregate supply (fig. 1.1). It is called macroeconomic equilibrium and is reached at the point of intersection of the aggregate demand (*AD*) and aggregate supply (*AS*) curves.

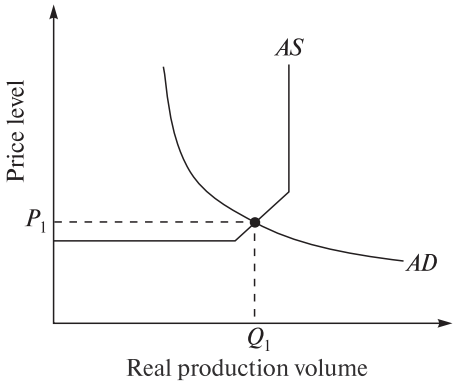

Fig. 1.1. Macroeconomic balance

The intersection of the curves of aggregate demand and aggregate supply determines the equilibrium price level and the equilibrium real volume of national production. It means that at a given price level (P_1), the entire national product produced (Q_1) will be sold. Here we should keep in mind that that prices rise easily, but hardly fall. Therefore, with a decrease in aggregate demand, one cannot expect during a short period of falling prices. Producers will respond to a decrease in aggregate demand by reducing output and only then, if this does not help, lower prices. Prices of goods and resources, once increased, do not immediately fall when aggregate demand decreases.

Macroeconomic equilibrium is the result of a circulation of the constituent parts of the gross domestic product and national income. In the absence of any barriers, all GDP will represent aggregate supply (*AS*) and all gross national income will be represented as aggregate demand (*AD*). *AD* equals *AS* as market expressions of GDP and NI. We can also state that: the problem of macroeconomic equilibrium is the problem of buying and selling gross domestic product, i.e. its exchange for national income. The equality of aggregate demand and aggregate supply was initially ensured by the equality of GDP and ND.

Classical and Keynesian approaches to macroeconomic equilibrium

There are *neoclassical* and *Keynesian* ideas about the balance of aggregate demand and aggregate supply. The first is that the mechanism of market competition automatically ensures the equality of aggregate demand and aggregate supply. Any long-term imbalance between them is excluded.

Neoclassicists try to prove this position by the fact that in market conditions, prices, wages, interest rates are quite flexible and quickly change under the influence of supply and demand, adapting to a new market situation. Competition equalizes supply and demand in all markets. In this case, there is no need for government intervention in the economy.

In contrast to neoclassicism, Keynesianism proceeds from the fact that prices, interest rates, and especially wages, are not flexible and change rather slowly in the short term. They move towards the equilibrium point of aggregate demand and aggregate supply slowly. If the neoclassicists consider it possible to ensure full employment, then the Keynesians argue that there is no mechanism that guarantees full employment, lower prices and wages, a decrease in total income, and hence the demand for labor. If the neoclassicists say that the state cannot influence either the level of employment in the country or the volume of production, then the Keynesians argue that the state can regulate the development of the economy by influencing aggregate demand. The lack of effective demand is the main cause of cyclical fluctuations in the market economy. They believe that the economic policy of the government will be able to increase the volume of national production and increase employment.

Criticism by Keynes of the classical equilibrium model concerns two points: firstly, the approach of the classics to the main relationships between investment, savings and the interest rate raises doubts; secondly, the economy does not develop as smoothly as the classics imagine, there is no elasticity of the ratio of prices and wages. The main premises of the classics and Keynesians can be presented in the following table 1.1.

Table 1.1

The main assumptions of the macro regulation of aggregate demand and aggregate supply of the classics and Keynesians

Parcels of classics	Keynesian premises
1. The economy operates in conditions of full employment of factors of production, therefore, the volume of output is equal to the potential volume of production. 2. Prices, the market interest rate and nominal wages are flexible, their changes maintain equilibrium in the markets. 3. The factors of production change slowly, and therefore the volume of product output changes slowly, since it depends on the number of these factors.	1. Prices, nominal wages and other nominal values are relatively rigid, slow to react to market fluctuations. 2. Real values (output volume, employment, real wages), on the contrary, are more mobile, react quickly to market fluctuations.

Any economic system strives to achieve an equilibrium state and maintain it. The functioning of the economy is ensured through the activities of people endowed with will, consciousness and equal interests, the balance of is not achieved spontaneously and has specific features and conditions.

Signs, conditions and types of macroeconomic equilibrium

We can distinguish the following signs of macroeconomic equilibrium:

1) compliance of public goals and real economic opportunities;

2) full use of all economic resources of society – land, labor, capital, information;

3) the balance of supply and demand in all major markets at the micro level;

free competition, equality of all buyers in the market, immutability of economic situations;

4) the economy is in constant motion, continuous development

The most *important conditions for achieving macroeconomic equilibrium* are:

1) compliance of national goals with the available economic opportunities;

2) availability and optimal use of all economic resources;

3) compliance of the production structure with the consumption structure;

4) the correspondence of aggregate demand and aggregate supply in all markets of the national economy.

According to Walras' law, general economic equilibrium is achieved when three out of four possible markets in macroeconomics are in equilibrium. In this case, the following type of equilibrium can be obtained:

– stable, i.e. self-healing after rejection;

– unstable – not self-regulating after deviation. Studying of stability and conditions for achieving general economic equilibrium is necessary to assess and overcome deviations, i.e. to conduct an effective economic policy.

The concept of "equilibrium" is also applicable in a broader context – to the entire socio-economic system of the country.

Socio-economic equilibrium is a state of the country in which economic development is subordinated to the achievement of strategic social goals of society: a high level of well-being with reasonable differentiation, preservation and improvement of environmental living conditions, accessibility of culture, education, medical care, etc.

Maintaining of the overall macroeconomic equilibrium is significantly complicated by a number of circumstances. Firstly, it is the presence of so-called external effects. Secondly, scientific and technological progress is constantly acting as a factor disturbing the general equilibrium.

In reality, a state of "equilibrium – disequilibrium" is usually observed, when deviations from equilibrium are continuously reproduced. In some cases, the disturbed equilibrium is restored by the market system itself due to its ability to self-regulate, in others, state intervention is required. The state can influence aggregate demand in three ways: by changing its own expenses, taxes and interest rate. Aggregate demand expands if the state increases its expenditures (cash payments to the population); reduces taxes; reduces the interest rate. This policy of the state is called the *policy of expansion*. The state can limit aggregate demand by reducing government spending, increasing taxes, and raising the interest rate. Such a policy is called *the policy of containment*.

A significant place in the study of macroeconomic equilibrium is occupied by the analysis of the cyclical nature of economic growth as its natural form.

1.4. BASIC MACROECONOMIC IDENTITIES

The main macroeconomic indicators are calculated in the system of *national accounts (SNA)* or national accounting (it is used in more than 170 countries around the world).

The system of national accounts is a system of interrelated indicators used to describe and analyze macroeconomic processes. It provides information about all stages of the economic cycle. Each stage of the economic cycle corresponds to a special account or group of accounts. The SNA takes into account the activities of all participants in social production and contains indicators that generalize all economic transactions.

As a result of information processing, a set of balance sheets is compiled, the indicators of which allow us to determine the generalizing macroeconomic indicators characterizing the state of the economy and the dynamics of economic growth.

One of the main macroeconomic indicators that assess the results of economic activity is the *gross domestic product (GDP)*. Its dynamics are used to assess the overall efficiency of the functioning of the economy and thus to determine the relative success or failure of economic policy measures implemented by the government.

Gross domestic product (GDP) is a macroeconomic indicator reflecting the market value of all final goods and services produced in a year in all sectors of the economy on the territory of a particular state for consumption, export and accumulation, regardless of the nationality of the factors of production used.

Gross national product (GNP) is the total value of the total volume of final production of goods and services at current prices (nominal GNP) or

base year prices (real GNP) produced on the territory of a given country and abroad, using factors of production belonging to a given country.

Gross domestic product has such forms as net domestic product, national income, personal income, disposable income, real income.

The net domestic product (NDP) is the most accurate macroeconomic indicator of goods and services created and purchased by the population of a given country for a certain period of time (month, quarter, year).

NDP is calculated by subtracting depreciation deductions from GDP:

NDP = GDP – Depreciation charges.

This indicator is used to characterize the net volume of production measured by the newly created value.

According to the classical methodology, *national income (ND)* is the value newly created in the branches of material production, a part of the total social product remaining at the disposal of society after deducting the cost of spent means of production. According to the natural-material composition, the national income consists of the entire mass of consumer goods and part of the means of production directed to the expansion of production. In terms of value, it consists of the necessary product (vital means for workers of material production) and the surplus product (additional vital goods produced).

National income proposes the stages of distribution, redistribution and use. The state, entrepreneurs and workers of material production participate in the distribution. The state, entrepreneurs and employees of the production and service sectors take part in the redistribution. National income is used for the purposes of current (annual) consumption of the population and accumulation. There should be an optimal ratio between consumption and accumulation funds. Excessive accumulation narrows the resources of current consumption, which will affect the standard of living of the population

The national income used for consumption and accumulation does not coincide in magnitude with the indicator of the national income produced. Firstly, the income used is reduced by the amount of losses (uncollected part of the crop in agriculture, damage from natural disasters, etc.). Secondly, it may decrease or increase depending on the foreign trade balance (the difference between the value of goods exported from the country and imported into the country). According to the modern methodology of calculating national income, which is currently used in Russia and other CIS countries, national income is the volume of gross domestic product minus depreciation.

Until recently, there was no a view on where and who creates national income. Today, the economists have come to the conclusion that it is formed by all those engaged in economic activity, who are both creators and recipients of income, regardless of profession and sphere of application of labor or capital.

Among them may be not only workers of material production, but also those employed in the service sector.

The amount of national income directly depends on the volume of GDP. Changes in GDP indicators directly affect the size of national income.

Personal income (PI) is income for direct spending by households. It is determined by the formula:

PI = individual income – social insurance contributions –
– corporate income taxes – undistributed corporate profits +
+ transfer payments.

PI is the main component of national income. *Disposable income (DI)* is personal income minus individual taxes. It is calculated by the formula:

DI = PI – Individual taxes.

With the help of disposable income, the amount of income of a family and individuals is measured. This is their income, directed to consumption and savings.

Real income is the sum of goods and services that can be purchased with monetary (nominal) income.

The object of final consumption of goods and services is the household expenditure on its own final consumption, the expenditure of state institutions to meet the individual and collective needs of society and the costs of individual final consumption of non–profit organizations to serve households.

Gross accumulation as a component of GDP is the sum of:

1) the amount of fixed capital accumulation in the form of investments by residents in production to create new income in the future;

2) the values of the value of reserves of unrealized working capital;

3) the amount of net acquisition of values.

The balance of exports and imports is an important element of the final use of GDP and is defined as the difference between exports and imports of goods and services.

National saving is a part of gross national disposable income that is not subject to consumption.

Saving is a source of financing accumulation, i.e. the growth of fixed assets, inventories of working capital and valuables.

Net lending (net borrowing) is an indicator that characterizes the amount of financial resources temporarily provided by a given country to other countries or temporarily received from them.

National wealth is the sum of the net capital of all economic entities of the country. National wealth is equal to the sum of all the country's assets (non-financial and financial) minus financial liabilities.

1.5. THE ROLE OF MACROECONOMIC INDICATORS. GDP AND OTHER INDICATORS OF INCOME AND PRODUCT. METHODS OF CALCULATING GDP

Macroeconomic indicators are of great importance for the government to make certain decisions in the political, social, and economic spheres. Therefore, an important task of the economic theory and practice of national management is to determine and regulate the most important macroeconomic indicators of the socio-economic development of the country, to study their essence, trends and factors affecting their size. Without this, it is impossible to effectively manage the development of the national economy in the interests of achieving the immediate and distant goals of socio-economic progress of society and the state.

It is important to develop forecast values of the main indicators and proportions of the development of the national economy. Macroeconomic calculations and analysis of the most important macroeconomic indicators, achieving proportionality (ratio) in their development allow:

– realistically assess the capabilities of the national economy in meeting internal and external needs, its regions and individual population groups;

– determine the development potential of individual sectors of the national economy and the national economy as a whole;

– develop strategy and tactics of economic reforms, foreign economic activity;

– to improve the economic mechanism of functioning of the national market of the country as a whole and its individual segments (labor markets, securities, investments, goods, etc.);

– to develop tax system, financial and credit system, structural, investment, social and other aspects of state policy;

– evaluate alternatives for the development of the national economy as a whole, its branches and regions.

This is not a complete list of issues and problems that should be addressed at the stage of planning and state regulation of the development of the national economy.

The economic potential of the country is the basis for the implementation of socio-economic tasks and goals of the state. It is created by the labor of all segments of the population, suppoted and maintained through the production system in the country and through its relations with other states.

The reproduction process, which is a complex socio-economic system, can be characterized by a whole group of important macroeconomic indicators and proportions. Their totality determines the scale of processes and phenomena that actually exist in the country's economy.

To identify the most reliable dynamics of socio-economic development, it is necessary to use a system of natural, labor and cost indicators. Currently, such an indicator is gross domestic product (GDP).

Gross domestic product expresses the result of the functioning of the economy for a certain period of development, characterizes the final products and services produced. It does not include the cost of consumed labor items and thus excludes the recount.

In the national statistics of some of the states (USA, Japan, etc.), the gross national product (GNP) is considered the main macroeconomic indicator. Some of the economists consider it a modification of GDP. Others, on the contrary, believe that GDP is a modification of GNP. Such statements have a real basis. In quantitative terms, the difference between GNP and GDP is small and is, as a rule, no more than 2 %. Their difference lies in the fact that GDP measures the cost of output of final products produced on the territory of a given country. GNP characterizes the value of the final product created on the territory of a given country and abroad with the help of production factors owned by citizens of a given country. Thus GDP and GNP coincide if a country does not export its factors of production to other states.

There are 3 ways to measure GDP: by expenditure – as the sum of end-user expenditures for the purchase of goods and services (end-use method) – production account; by income – as the sum of incomes of economic entities created in the production process (distribution method) – distribution account; by value added (production method).

GDP by expenditure is calculated as the sum of the total expenditures of all subjects of the market economy. As it is known from the course of microeconomics, three main economic entities participate in the economic activity of the country: households, firms and the state. It is they who carry out the total expenses.

The components of these expenses are named as follows:

C (consumption) – personal consumer spending, household consumption; includes the funds of the population directed to the purchase of current consumption goods, durable goods, as well as payment;

Ig (gross investment) – gross private domestic investment, consumption of firms; consists of purchases by entrepreneurs of machinery and equipment, all construction costs and changes in working capital stocks; gross investment includes domestic investment and depreciation: $Ig = In + D$, where *In* (net investment) is net investment; *D* (depreciation) – depreciation;

G (government) – government expenditures; includes government expenditures for the purchase of goods and services (final products), as well as the purchase of production resources (public procurement); the only type

of state budget expenditures not included in this element of total expenditures are transfer payments, which do not reflect an increase in current production, but are a form of redistribution government spending.

NX (net export) – net exports, added to the components of total expenditures in an open economy; defined as exports (*X* – export) minus imports (*M* – import): $NX = X - M$.

Thus, the calculation of the produced GDP by expenditure (*Y*) can be represented by the equation: $Y = C + Ig + G + NX$. The equation written in this form is called *the basic macroeconomic identity*.

GDP by income characterizes the order of distribution to the incomes of economic entities (remuneration for labor, rent payments, interest, profit) and the formation of distributed funds not related to the payment of income. It is calculated as the sum of all incomes of all factors of production (labor, land, capital, entrepreneurship) involved in production activities. The components of these revenues are designated and named as follows:

W – remuneration for the work of employees; includes directly wages paid by firms to employees, as well as many additions to wages (contributions of entrepreneurs to social insurance, private social security funds, medical care, etc.);

R – rental income (payments); income received by owners of land, buildings and structures and other real estate;

r – percentage; forms an item of income of owners of monetary capital;

P – profit; consists of two main elements – corporate profits and income on the property of the non-corporate business sector.

Funds which are not related to the payment of income include: *D* – depreciation charges; T_i – net indirect taxes on business, i.e. taxes minus subventions.

The final calculation of GNP (GDP) by income can be represented by the equation: $Y = W + R + r + P + D + T_i$.

Along with the calculation of GNP (GDP) by expenditure and income, there is a third method of it calculating, based on the concept of value added. Value added is the difference between the revenue from the sale of products (of an individual company or industry as a whole) and the cost of raw materials and materials consumed in the production of these products.

In SNA of the GDP by value added is determined by summing up the cost of goods and services produced in a country, minus the cost of intermediate products at each stage of production. Thus, GDP in macroeconomics, acts as the sum of the added value of all producers and allows us to take into account the contribution of various firms and industries to the creation of GDP. For the economy as a whole, the sum of all added value, should be equal to the value of all final goods and services.

1.6. NOMINAL AND REAL INDICATORS. PRICE INDICES

It is necessary to distinguish the nominal and real macroeconomic indicators and, above all, nominal and real GDP. Nominal GDP is GDP calculated in current prices. Real GDP is the GDP in which the price level change has been eliminated. The ratio of nominal GDP to real GDP is called the GDP deflator.

The deflator is one of the price indices used to measure changes in the price level in the country.

Nominal GDP is a product whose value is expressed in current, actual prices. *Real* GDP is a product whose value is expressed in constant prices.

Nominal GDP can increase both due to an increase in the physical volume of all products, and due to an increase in the price level. The price level does not affect real GDP. Therefore, real GDP is the main indicator of the physical volume of goods and services. Real GDP is determined by the formula

Real GDP = Nominal GDP / Price index.

The price index, in turn, is determined by the formula

Current year price index = Current year price / Base period prices.

The price index expresses the relative change in the average price level of a wide group of goods over a certain period.

The ratio of nominal GDP to real GDP is called the GDP *deflator*. It is determined by the formula:

GDP deflator = Nominal GDP / Real GDP.

The GDP deflator expresses the differences between nominal and real GDP and is used to determine the level of inflation. It shows how much GDP has increased due to an increase in the price level.

The deflator can be calculated in two ways: through the flow of final products and through the flow of income and costs. In accordance to the first method, final products are measured as products, that go to personal consumption; transferred consumption (accumulation); government consumption; part of goods and services sold abroad (foreign trade balance). The second method of calculation the deflator is a summary of the costs of wages and salaries, before taxes, interest and rent, indirect taxes, depreciation, profit.

In addition to the GDP deflator, other price indices are also used: the consumer price index (CPI), the producer price index (PPI). At the same time, both fixed sets of goods (the so-called “consumer basket”) and variable ones can be used as price weights. In this regard, the Laspeyres, Paasche and Fischer price indices should be highlighted.

The Paasche Index is one of the main price indices characterizing price changes over a certain period of time; it is named after the German statistician, economist and politician G. Paasche who proposed it.

The Paasche index shows the cumulative change in prices observed in the t_1 period compared to the base period t_0. The physical sales volumes of the final (current) period are used as weights characterizing the structure of the commodity group. The formula of the Paasche price index looks like this:

$$I = \frac{\sum p_1 q_1}{\sum p_0 q_1},$$

where p_1 – is the price of each type of product in the current period; p_0 – is the price of each type of product in the base (previous) period; q1 is the quantity of each type of product sold in the current period.

The Paasche index can also be represented as an average value from individual price indices.

The Laspeyres Index is named after the German economist and statistician E. Laspeyres, who proposed it in 1871. It is symmetrical with respect to the Paasche index, calculated in the same way, but the sales volumes of the base period q0 are used as weights.

$$I_p = \frac{\sum p_1 q_0}{\sum p_0 q_0}.$$

Both indices, being equivalent characteristics of the aggregate price change, generally give different quantitative results. The Fischer Index has been developed to combine them.

The Fisher Index is named after the American economist I. Fisher, who proposed it in 1922. The Fischer index shows the cumulative change in prices observed in period t_1, compared to the initial period t_0 and represents the geometric mean of the Laspeyres and Paasche indices. The Fisher index formula allows you to form an estimate based on some averaging of the influence of the structures of the initial and final periods and looks like this:

$$I_F = \sqrt{I_L + I_P},$$

where I_F – is the Fischer index; I_L – is the Laspeyres index; I_P – is the Paasche index.

Such an approach to averaging indices based on calculating the geometric mean is sometimes referred to as the Fisher approach.

The producer price indices calculated for representative goods are aggregated into price indices of the corresponding types, groups, classes, and sections of economic activity.

QUESTIONS

1. Define macroeconomics?
2. What is the subject of macroeconomics?
3. Why did macroeconomics arise only in the 1930s? What event in the 1930s aroused particular interest in macroeconomics?
4. What is a macroeconomic model?
5. Formulate the main macroeconomic identities.
6. What is the difference between gross domestic product and gross national product?
7. How is GNP determined?
8. What methods are used to measure GDP?
9. Why are economic indicators calculated in nominal and real values?
10. What is the price index and the GDP deflator?
11. How do CNP, ND and personal income relate to each other?
12. For what purposes was the system of national accounts created?

2. MARKET OF GOODS AND SERVICES

Basic concepts
Goods and services market. Aggregate demand. Aggregate supply. Macroeconomic equilibrium. Keynesian equilibrium model, IS curve. Multiplier of autonomous expenditures. Tax multiplier and Government spending multiplier.

2.1. AGGREGATE DEMAND AND ITS STRUCTURE

The market of goods and services is the central link of macroeconomics. The buyers in the commodity market are four macroeconomic entities that form its aggregate demand (*AD*) and structure:

$$AD = C + I + G + X_n,$$

where C – total household demand; I – demand for investment goods from enterprises; G – demand for goods and services from the state; X_n – the demand for domestic goods from foreign countries is net exports.

Aggregate demand consists of demand for consumer investment goods, and its value reflects the volume of national expenditures (E).

So, ***aggregate demand AD*** is the summary of all individual demands for final goods and services offered on the market. It follows that aggregate demand shows different real volumes of goods and services, that consumers are willing to buy at different possible price levels.

There is an inverse relationship between aggregate demand and the price level in the country, all other things being equal. With a decrease in the price level P, the realized volume of national production Q increases. Accordingly, an increase in the price level causes a reduction in aggregate demand, with constant other factors of the market situation.

The graph of the demand function is shown in fig. 2.1.

The main factors influencing the change in aggregate demand are divided into price and non-price.

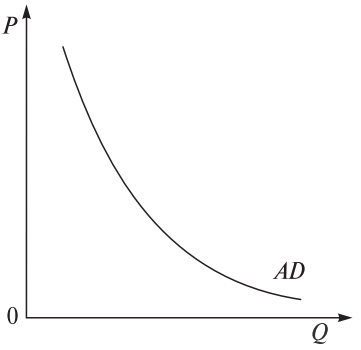

Fig. 2.1. Aggregate demand curve:
P is the price level;
Q is the actual volume of production

The *price factors* of aggregate demand include: the interest rate effect; the wealth effect; the effect of import purchases.

The effect of the interest rate. With an increase in the price level, consumers and producers are forced to take money on credit. This leads to an increase in the interest rate, a decrease in purchasing power, and a reduction in investment. As a result, aggregate demand decreases. Thus the essence of the interest rate effect is the effect of the changing price level on the interest rate, and, consequently, on consumer spending and investment. So an increase in the price level leads to an increase in the interest rate, and this leads to a reduction in consumer spending and investment, and vice versa.

The effect of wealth. When the price level rises, the value of stocks, bonds, and financial assets falls, the population becomes poorer and aggregate demand decreases.

The effect of import purchases. This effect occurs when the ratio of prices for domestic and imported goods changes. With an increase in the price level within the country, the demand for domestic goods decreases, and for cheaper imported goods increases. With unchanged customs tariffs, there will be an increase in import volumes and a decrease of export volumes. As a result, the volume of net exports will fall, and with it, the volume of aggregate demand. A decrease in prices will lead to an excess of exports over imports, which will have a very positive effect on the volume of aggregate demand.

Non-price factors of aggregate demand. There are several non-price factors that influence the real volume of the product, that households, businesses, the government and foreign buyers are willing to buy at this price level. Non-price factors are divided into four groups according to the main components of aggregate demand (table 2.1).

Table 2.1

Non-price factors of aggregate demand

Changes in consumer spending C	Changes in investment expenses I	Changes in government spending G	Changes in net export expenditure X_n
Consumer income	Interest rates	Changes in government spending	Changes in the conditions of foreign trade
Consumer expectations	Expected return on investment	Adoption of state programs	National income in foreign countries
Consumer debt	The level of taxes	–	Exchange rates
Consumer taxes	Technology	–	–

The aggregate offer AS is understood as the sum of all individual offers. In other words, the aggregate supply is the monetary value of the total amount of all final goods and services on the market. The value of the total supply is influenced by price and non-price factors.

The price factors are:

1. Operating at the micro level and causing a change in the supply of a particular product on the market (production technology, costs, etc.).

2. Factors functioning at the macro level, their quality and quantity. In this case, quality is characterized by the productivity of factors (more skilled labor and more advanced equipment). An increase in the quantity and an increase in the quality of factors lead to an increase in production capacity, and, consequently, to an increase in the total supply of *AS*.

Non-price factors of the aggregate supply. The aggregate supply curve establishes the relationship between the price level and the real volume of national production, all other things being equal. Changes in the volume of national production lead to movement along the *AS* curve. These changes are called price factors. A changes of more then "other conditions" causes a shift of the AS curve. These conditions are called *non-price factors*.

There are several non-price factors that shift the aggregate supply curve:

– changes in resource prices;

– changes in labor productivity;

– changes in business conditions.

All the non-price factors of the aggregate supply are united by the fact that with their change, the costs per unit of production change.

Changes in resource prices. An increase in the supply of domestic resources due to new technical improvements, an increase in the available labor resources; the direction of most of the savings for investment; an increase in the number of people seeking entrepreneurship, lead to lower prices for these resources. As a result, unit costs are reduced, and the aggregate supply curve shifts to the right. Conversely, a decrease in the supply of resources increases the price for them, and the total supply curve shifts to the left.

Changes in labor productivity. Labor productivity is understood as the ratio of the real volume of production to the amount of labor used

$$\text{Labor productivity} = \text{Real production volume} / \text{Number of labour resources}.$$

The growth of labor productivity shows that with the available volume of labor resources, it is possible to receive larger real volume of national production, i.e., costs per unit of output decrease, and the curve of aggregate supply shifts to the right. A decrease in labor productivity will increase costs and shift this curve to the left.

Changes in business conditions. Government intervention can either expand or reduce the aggregate supply, depending on the priorities of the economy at one stage or another. For example, an increase in tax rates increases, all other things being equal, production costs and thereby reduces aggregate supply. On the contrary, state subsidies and various benefits to enterprises, contribute to reducing their production costs and thereby expanding the aggregate supply.

The aggregate supply is presented in the form of an *AS* curve, which shows the level of available real output at each possible price level. The *AS* curve shows a direct dependence of the volume of production on the price level. With a higher price level, there are incentives to increase the volume of production and, consequently, the supply of goods. Thus, the curve has an ascending form, in the same way as the supply curve in individual commodity markets. However, the shape of the *AS* curve may be different depending on whether the aggregate supply is being considered in the long or short term.

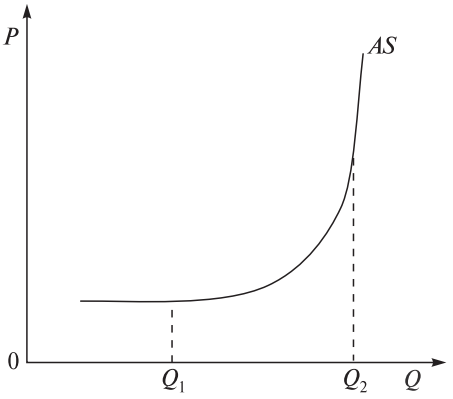

Fig. 2.2. The aggregate supply curve:
P – price level; *Q* – real production volume

As can be seen from the graph (fig. 2.2.), the aggregate supply curve differs from the supply curve of a single product and consists of three segments.

1. Horizontal (Keynesian). The horizontal segment characterizes the economy during the depression. In this segment of the curve, in the short term, production is carried out with underemployment, underutilization of production capacities, fixed prices and wages, a significant level of unemployment, i.e. the presence of excess resources. This indicates the state of the economic downturn. In this situation, the growth of output can be achieved through the use of unclaimed resources. Keynes argued that in a depression, it is possible to expand production without fear of increasing production costs or prices.

2. Intermediate (ascending). The intermediate interval between Q_1 and Q_2 reflects a state when the economy is close to the full use of resources. The increase in production volume is accompanied by an increase in prices. This is because in some industries, the limitations of the excess resources involved are beginning to be felt, inefficient equipment is often used. Thus, the costs of producing of a unit are increasing and higher prices are needed to compensate for them.

3. Vertical (classical). The vertical segment shows that the economy has reached full employment with Q_2 output. The available resources are already involved and further expansion of production in the short term is impossible, therefore, any increase in prices will not lead to an expansion of production. Therefore, in the long term, the aggregate demand curve practically tends to a vertical position. The segment is called classical in accordance with the conclusions of classical economics about certain forces inherent in a market economy, thanks to which full employment becomes the norm.

In fact, the shape of the aggregate supply curve is controversial. Representatives of the classical or neoclassical school argue that the entire curve of aggregate supply is vertical, and changes in aggregate demand are insignificant, since they affect only the price level and do not affect production and employment. Keynesians, on the other hand, believe that the aggregate supply curve is either horizontal or ascending, and therefore any decrease in aggregate demand has negative and very costly consequences for production and employment.

2.2. EQUILIBRIUM IN THE MARKET OF GOODS AND SERVICES. KEYNESIAN MODEL OF EQUILIBRIUM, HER GRAPHIC ILLUSTRATION

Macroeconomic equilibrium presupposes the correspondence of aggregate demand *AD* and aggregate supply *AS*. Aggregate demand corresponding to aggregate supply is called effective demand. At the macro level, the intersection of the curves *AD* and *AS* determines the overall equilibrium price level *P* and the equilibrium real output *Q*. The level of GNP in monetary terms in this case is equal to the product of the total price level P by the volume of production *Q*

$$\text{GNP} = PQ.$$

Since the equilibrium price level and the equilibrium real volume of national production are determined by the intersection point of the curves of aggregate demand and aggregate supply, in practice, various variants of their intersection are possible on different sections of the curves (fig. 2.3).

1. Equilibrium on the Keynesian segment of the curve *AS*. The movement towards the equilibrium real volume of GNP is not accompanied by a change in the price level, but is caused by the involvement of unused resources in production.

2. Equilibrium on the intermediate segment of the curve *AS*. A change in the price level excludes overproduction or underproduction of goods.

3. Equilibrium on the classical segment of the curve *AS*. Here, an increase in the total supply is almost impossible due to the maximum use of production capabilities and the lack of reserves. Consequently, the price level increases.

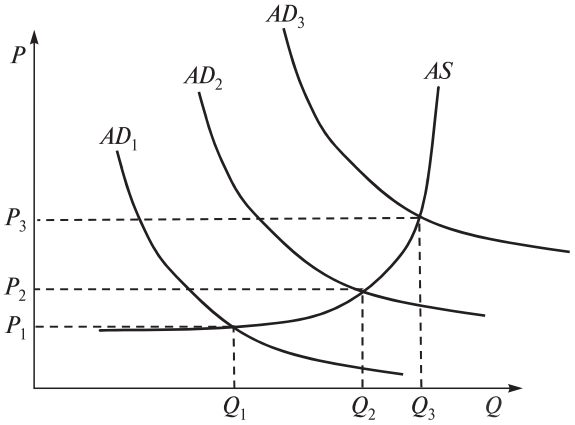

Fig. 2.3. Macroeconomic equilibrium

Thus, the expansion of aggregate demand in the Keynesian segment leads to a significant increase in the real volume of GNP and employment without an increase in the price level. In the interim, the expansion of aggregate demand will lead to an increase in the real volume of GNP and to an increase in the price level. In the classical segment, labor and capital are fully used, and the expansion of aggregate demand will have an impact only on the price level. The real volume of GNP will remain at the level of full employment. It turns out that the displacement of the aggregate demand curve increases the price level in the intermediate and classical segments of the aggregate supply curve and leads to demand inflation.

A decrease in aggregate demand will entail, in the Keynesian segment, a decrease in the volume of national production, with the price level remaining unchanged; in the intermediate segment, a decrease in the real volume of national production and the price level; in the classical segment, a drop

in prices, with full employment and the volume of national production unchanged.

But in fact, when the aggregate demand curve shifts to the left, the so-called ***ratchet effect*** occurs. The reverse movement of aggregate demand may not restore the initial equilibrium, at least for a short period of time. The difficulty lies in the fact that prices for both goods and resources are becoming inflexible, and do not show a downward trend. Economic indicators, once increased, do not necessarily decrease, at least to the initial level. In other words, prices rise easily, but do not immediately fall, or do not fall at all. This complicates macroeconomic forecasts with a decrease in aggregate demand.

A decrease in aggregate supply leads to inflation caused by an increase in costs, i.e., when aggregate supply decreases, the price level increases, employment decreases and inflation occurs. The combination of a decline in production and inflation is commonly called ***stagflation***.

The growth of aggregate supply entails an increase in the real volume of national production and a decrease in the price level.

Thus, the shift in the aggregate supply curve leads to a change in the real volume of national production at full employment. In particular, the shift of the curve to the right indicates economic growth and indicates an increase in the production potential in the economy.

Let's find out whether the market mechanism has the ability to ensure equality of aggregate demand and aggregate supply at full employment? Classical theory, on the one hand, and Keynesian theory, on the other, answer this question differently.

Representatives of the classical trend (A. Smith, D. Ricardo) have developed a theory of general economic equilibrium that automatically ensures equality of income and expenses at full employment. The starting point of this theory is the analysis of such categories as interest rate, salary, price level. These key variables, which in the view of the classics, are flexible quantities, provide equilibrium in the capital market, labor market and money market. Interest balances the supply and demand of investment funds; salary balances the supply and demand in the labor market; flexible prices ensure the sale of products.

Thus, *the market mechanism in the theory of the classics itself is able to correct the imbalances that arise on the scale of the national economy*, and state intervention is unnecessary.

However, in the early 30s of the XX century. the classical theory was unable to explain the long-term crisis processes. J. Keynes tried to give such an explanation. It should be noted that Keynes' theory pays great attention to psychological factors in the economy. The principles of macroeconomic equilibrium are permeated with psychological coloring: "inclination", "preference", "expectation", "aspiration". This is not the notorious "idealism"

of economic thought, but a reflection of the objective reality in which living people with their inherent passions and inclinations act.

It should be noted that the main provisions of the Keynesian theory revolutionized economic science in the mid-1930s and gave impetus to the development of macroeconomics.

Firstly, Keynes, unlike the classics, put forward the position that it is not aggregate supply that determines aggregate demand, but, on the contrary, aggregate demand determines the level of economic activity, i.e. the maximum possible level of output (aggregate supply) and, accordingly, employment.

Secondly, Keynes assumed that wages and prices do not have perfect flexibility.

Thirdly, the interest rate does not equalize the volume of investments and savings, as it appears in the classical model.

Fourth, full employment is not achieved automatically in the economy, and this gives grounds for state intervention in economic processes.

On the left in the fig. 2.4 the AS curve has several sections; therefore, an increase in aggregate demand (AD moves to a new position AD′) in the horizontal section (a period of recession in the economy) has the consequence of an increase in GNP (from Q_E to $Q_{E'}$), without price growth.

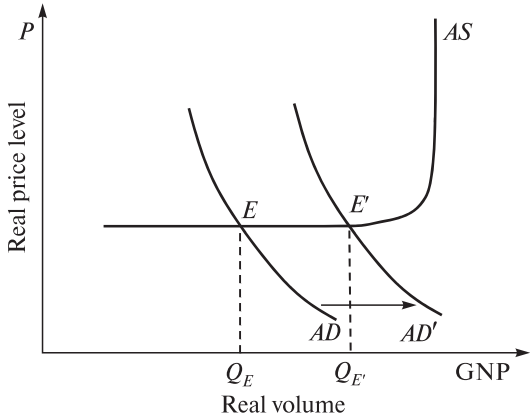

Fig. 2.4. The model of macroeconomic equilibrium $AD = AS$ in the Keynesian interpretation

The Keynesian school believes that the aggregate supply curve is either horizontal during a period of deep recession and underemployment of resources, or ascending during a period of economic recovery and increased employment of resources.

2.3. GRAPHIC PLOTTING OF THE *IS* LINE. ALGEBRAIC REPRESENTATION OF THE *IS* LINE. *IS* LINE SHIFT FACTORS

***The IS curve* (*"investment – savings"*)** describes the equilibrium in the commodity market and reflects the relationship between the market interest rate r and the income level *Y*. The *IS* curve is derived from a simple Keynesian model (the total expenditure equilibrium model or the Keynesian cross model), but differs in that part of the total expenditure and, above all, investment costs now depend on the interest rate. The interest rate ceases to be an exogenous variable and becomes an endogenous value determined by the situation on the money market, i.e. within the model itself. The dependence of a part of total expenses on the interest rate results in the fact that for each interest rate there is an exact value of the equilibrium income value and therefore an equilibrium income curve for the commodity market can be constructed – the *IS* curve. The equality of investments and savings is observed at all points of the *IS* curve (*IS*: Investment = Savings).

The simplest graphical output of the *IS* curve is associated with the use of savings and investment functions.

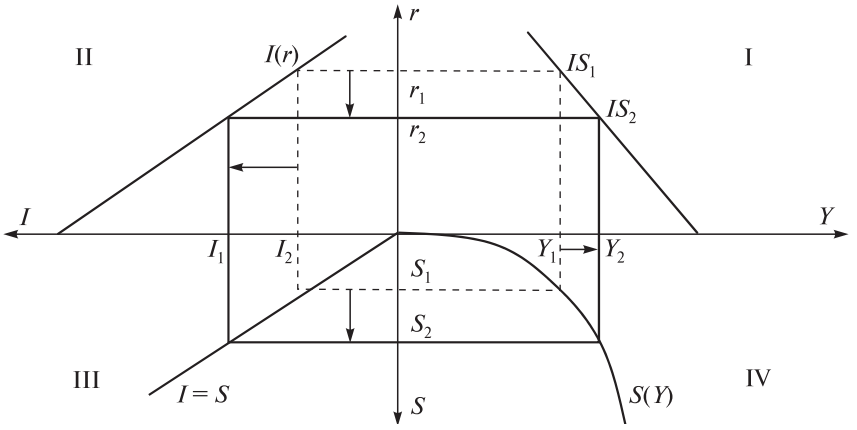

Fig. 2.5. Graphical output of the *IS* curve

Figure 2.5 in quadrant IV shows a graph of the savings function $S(Y)$: with an increase in income Y_1 to Y_2, savings increase from S_1 to S_2. Quadrant III shows a graph $I = S$ (a line at an angle of 45 ° to the coordinate axes I and S). $I_1 = S_1$, $I_2 = S_2$. Quadrant II presents a graph of the investment function $I = I(r)$,

showing investment growth as a function inverse to the interest rate level *r*. Based on these data, in quadrant *I* we find a set of equilibrium combinations of *Y* and *r*, i.e. the curve *IS*: $IS_1(Y_1, r_1)$ and $IS_2(Y_2, r_2)$, the lower the interest rate, the higher the income level.

Similar conclusions can be obtained using the Keynesian Cross model (see fig. 2.5).

The investment graph (fig. 2.6, I) shows that low interest rates correspond to a high level of investment. At the interest rate level r_1, the volume of planned investments will be I_1. Accordingly, the total expenditures E_1 (fig. 2.6, II) are shown by the line $C + I_1(r_1) + G$, which, intersecting with the bisector, determines the equilibrium point E_1 and the equilibrium volume of national income Y_1. Thus, at the interest rate r_1, the national income Y_1 will be in equilibrium. These parameters will define point *A* (fig. 2.6, III). If the interest rate rises from r_1 to r_2, investments decrease from the level I_1 to I_2 (see fig. 2.6, I), the curve of total expenses shifts down to the position $C + I_2(r_2) + G$ (see fig. 2.6, II). This, in turn, reduces the level of national income equilibrium from Y_1 to Y_2 (see fig. 2.6, III). These parameters will determine point *B*. If we continuously change the values of the interest rate and find the corresponding values of national income for each, we get the *IS* curve (see fig. 2.6, III).

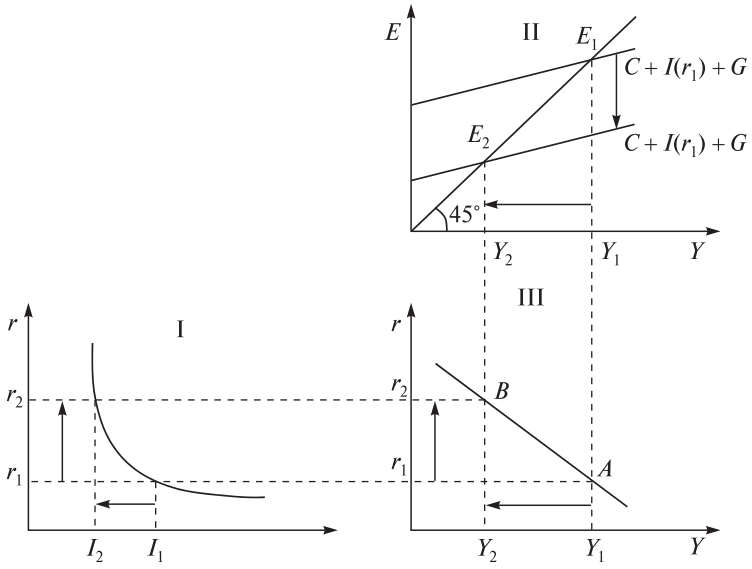

Fig. 2.6. Graphical output of the *IS* curve from the Casian Cross model

The *IS* curve has a negative slope, that is, the output that balances the market of goods falls with an increase in the interest rate. A higher level of the interest rate causes a decrease in investment and consumer spending, and, consequently, aggregate demand (aggregate spending), which leads to a lower level of equilibrium income. The movement along the IS curve shows how the level of national income should change when the interest rate level changes in order to maintain equilibrium in the market of goods.

The *IS* curve divides the economic space into two areas (fig. 2.7). At all points above, the supply of goods is greater than the demand for them, i.e. the volume of national income is greater than the planned expenditures. At point *A*, the cumulative output of Y_1 is greater than the equilibrium one. This oversupply of goods leads to an unplanned accumulation of stocks, as a result of which output decreases and the economy moves towards the *IS* curve. At all points below the *IS* curve, there is a shortage in the goods market. At point *B*, the volume of total output Y_2 is below the equilibrium. Excess demand leads to an unplanned decrease in inventories, which implies an increase in output and a shift towards the *IS* curve. Thus, the IS curve connects the points at which the total quantity of goods produced is equal to the total volume of demand for them.

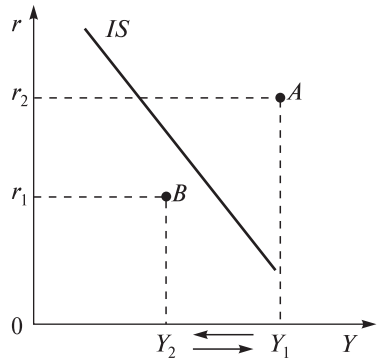

Fig. 2.7. The *IS* curve

Shifts in the *IS* curve are caused by changes in any of the components of expenditures *C*, *I*, *G* and taxes *T*. Everything that increases spending: the optimism of entrepreneurs and consumers, which increases their desire to increase spending at any interest rate, which leads to an increase in consumer and investment spending; an increase in government spending; a reduction in accord taxes; an increase in transfer payments, shifts the *IS* curve to the right, and vice versa. Thus, the *IS* curve shifts from the IS_1 position to the IS_2 position (fig. 2.8) as a result of: an increase in consumer spending; an increase in planned investments (not related to

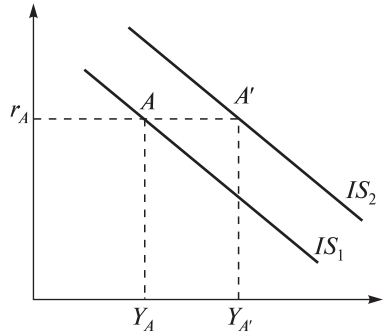

Fig. 2.8. Shifts of the *IS* curve

a change in the interest rate); an increase in government spending; a reduction in taxes.

Algebraic analysis of the curve *IS*. The most complete picture of the relationship between the income level, the interest rate and the features of the IS curve is given by its algebraic analysis. The equation of the curve *IS* can be obtained by substituting the function of consumption and investment into the main macroeconomic identity and its solution with respect to *Y*:

$$Y = a + b \cdot (Y - T) + c - d \cdot r + G.$$

The equation of the curve *IS* with respect to *Y* has the form:

$$Y = \frac{a+c}{1-b} + \frac{1}{1-b} \cdot G + \frac{-b}{1-b} \cdot T + \frac{-d}{1-b}.$$

The *IS* curve has a negative slope, because the coefficient at the interest rate is negative. If the investment is very sensitive to the interest rate, then d is large and the *IS* curve is flatter, otherwise it is relatively steep. The slope of the curve *IS* also depends on the marginal propensity to consume b: the greater the marginal propensity to consume, the greater the change in income resulting from a change in the interest rate. The angle of the *IS* curve is determined by two factors: the multiplier of government spending and the sensitivity of investments to the interest rate. Since the coefficient at *G* (the multiplier of government spending) is positive, the growth of government spending shifts the *IS* curve to the right, and the coefficient at *T* (the tax multiplier) is negative and tax growth shifts the *IS* curve to the left. In addition, the greater the marginal propensity to consume, the greater the multiplier value, and therefore the greater the shift of the *IS* curve. The *IS* curve shifts by a smaller distance when taxes change than when government spending changes by the same amount.

2.4. MULTIPLIER OF AUTONOMOUS EXPENSES. TAX MULTIPLIER AND MULTIPLIER OF GOVERNMENT SPENDING

A change in any component of autonomous expenditures leads to a change in the equilibrium output volume. But the change in output (income) turns out to be greater than the initial change in autonomous expenses. This is due to the multiplier effect. Let's first consider the simplest model of a closed economy without a public sector, where total expenditures are made up of consumer and investment ($E = C + I$), and the consumption function has the form

$$C = C_a + bY.$$

If autonomous expenses increase by ΔA (this may be an increase in investments), then total expenses and output (income) will also increase by ΔA ($\Delta Y = \Delta A$) at the beginning. An increase in income will lead to an increase in consumption, but not by the same amount, but by $b\Delta A$. The remaining part of the income gain is saved. An increase in consumption leads to an increase in expenses by the same amount of $b\Delta A$. Further, production increases again to meet demand, output (income) increases by $b\Delta A$. Income growth will again increase consumer spending – now by $b(b\Delta A) = b^2\Delta A$. Increased consumer demand will again lead to an increase in output and income, etc. It is also obvious that each time the amount of income growth will be less. The steps of increasing expenses and income (output) can be represented as follows (table 2.2).

Table 2.2

The steps of increasing expenses and income

Step	Increase in expenses	Increase in income (output)
1-st	ΔA	$\Delta Y_1 = \Delta A$
2-st	$b\Delta A$	$\Delta Y_2 = b\Delta A$
3-st	$b^2\Delta A$	$\Delta Y_3 = b^2\Delta A$

If we sum up all the income increments equal to the expense increments and apply the formula for the sum of the decreasing geometric progression (the sum in parentheses) with a base less than one ($b < 1$), we get:

$$\Delta Y = \Delta A + b\Delta A + b^2\Delta A + b^3\Delta A + \ldots = \Delta A(1 + b + b^2 + b^3 + \ldots) = \Delta A \frac{1}{1-b}.$$

Thus, the total change in income is equal to the initial change in total expenses multiplied by $\frac{1}{1-b}$. The multiplier $\frac{1}{1-b}$ is called the *multiplier* (t) and shows by what amount the equilibrium income (output) will change when the total expenses per unit change:

$$m = \frac{1}{1-b} = \frac{\Delta Y}{\Delta A}.$$

Let's look at this process with an example. Suppose an airline decides to invest $100 million in the purchase of a new aircraft. In this case, the initial increase in autonomous investment costs will amount to $100 million. An increase in investment spending will increase GDP by the same amount. The expansion of production at the aviation plant means that the incomes

of its employees will increase, and new workers may be hired. The income of the owners of the shares of the aviation plant will also increase against the background of profit growth. In general, revenues will grow by the same amount – 100 million. Income is distributed between consumption and savings in accordance with the marginal propensity to consume. Let's assume that it is equal to 0.8, i.e. 80 out of 100 units of income are spent on consumption, and 20 are saved (for now, to simplify, we assume that there are no taxes). Thus, the plant's employees and shareholders will be able to spend an additional $80 million on the purchase of goods and services. Trading enterprises will make additional orders for the supply of goods worth $80 million to manufacturing enterprises, thus stimulating the growth of production and income of employees and owners of these enterprises by the same amount. Employees of manufacturing enterprises, having received additional income, will also be able to increase their consumer spending by $64 million (in accordance with the marginal propensity to consume), which will cause further growth in production and income of supplier enterprises, etc. As shown below, the expenses of the first three periods will lead to an increase in income by 100 + 80 + 64 = $244 million and the process will continue – each round of spending will stimulate new growth in production, income and new induced consumer spending (table 2.3).

Table 2.3

Periods	1	2	3	4
ΔY	100	80	64	...
ΔC	80	64	51,2	...
ΔS	20	16	12,8	...

The maximum possible total increase in income (due to multiple increases in income and consumer spending) at $b = 0.8$ will be in our example $\Delta Y = 100 \cdot (1 / 1 - 0.8) \cdot 100 \cdot 5 = 500$ million rubles.

The multiplier of autonomous (in this case investment) expenses will be equal to five.

Thus, an increase in autonomous expenses by $100 million led to an increase in the equilibrium level of income by $500 million.

Note that initially, when autonomous expenses increase, the planned expenses exceed the output volume. Firms are beginning to reduce inventories and increase output. As output and income grow, the induced expenses (dependent on income) increase, in this case, consumer spending. Therefore, the final increase in the equilibrium volume of output (income) can be

represented as the sum of the initial increase in autonomous expenses (100) and expenses induced by the subsequent increase in income (80 + 64 + 51,2 +...).

So far, a simple multiplier model for a two-sector economy has been considered. Now let's complicate the analysis – consider the open economy and supplement the model with the public sector.

If we turn to the consumption function, which includes the full tax function

$$C = C_a + b(Y - T) = C_a + b(Y - T_a - tY + Tr) =$$
$$= C_a + bY - bT_a - btY + bTr = C_a - bT_a + bTr + b(1 - t)Y,$$

and consider an open economy, where the equilibrium income level is determined by the equation

$$Y = A + [b(1 - t) - n]Y; \quad Y = A\frac{1}{1 - b(1 - t) + n},$$

then the increase in income caused by changes in autonomous expenditures will be equal to

$$\Delta Y = \Delta A\frac{1}{1 - b(1 - t) + n},$$

where $\frac{1}{1 - b(1 - t) + n}$ – multiplier of autonomous expenses.

The increase in income is thus determined by the change in autonomous expenses and the value of the multiplier. The latter, in turn, depends on the marginal propensity to consume b, the tax rate t and the marginal propensity to import P. Thus, with an increase in autonomous expenditures, for example investments, the volume of GDP will also increase. But in the presence of income taxes, and even more so with their increase, disposable income will increase to a lesser extent than GDP. Accordingly, consumption will also increase less than it could in the absence of income taxes or at their unchanged level. As a result, the process of multiplication will lead to a smaller increase in GDP (income). Similarly, if part of consumer spending is on imports, they do not stimulate the growth of the country's GDP. Therefore, an increase in the marginal propensity to import leads to a decrease in the growth of GDP and income in the process of multiplication. Arithmetically, an increase in the tax rate t and the marginal propensity to import n leads to a decrease in the multiplier value. Conversely, an increase in the marginal propensity to consume means that most of the income growth is spent on consumption (less is saved), which means that consumer spending stimulates a greater increase in GDP and income. The growth of b increases the value of the expense multiplier.

According to Keynesian concepts, short-term equilibrium in the economy can be established at a level below potential ($Y_0 < Y^*$), i.e. full employment

of resources (fig. 2.9). In this case, they talk about a **recessionary gap** – the amount by which it is necessary to increase aggregate expenditures (aggregate demand) in order for GDP to reach a potential value, ensuring full employment in the economy (the distance of the SUN) (see fig. 2.9). To bridge this gap and achieve full employment, the State can increase aggregate spending, thereby stimulating the growth of output and employment.

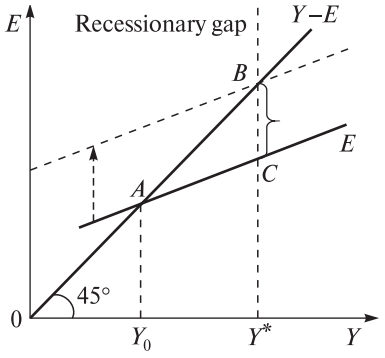

Fig. 2.9. Recessionary gap

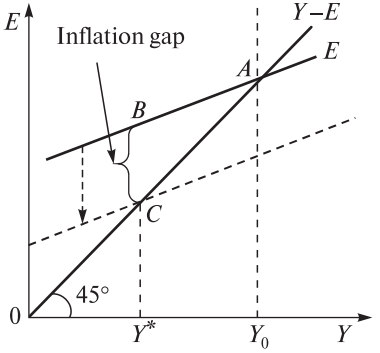

Fig. 2.10. Inflation gap

If the actual GDP for some reason exceeds the potential output level, they talk about the **inflation gap** – the amount by which total expenditures exceed the output level at full employment. In other words, this is the amount by which the total expenditure curve should shift down so that the equilibrium output level is equal to the potential (the distance of the sun in fig. 2.10). To bridge the inflationary gap, the government can reduce spending, transfers or increase taxes.

Thus, the government can change aggregate expenditures in several ways: firstly, by increasing or decreasing government purchases of goods and services (as is known, they are part of aggregate demand), and secondly, by changing taxes or transfers. Taxes and transfers affect demand indirectly – through changes in disposable income.

If government spending increases in order to close the recession gap – and they are part of total spending – this means that at a given income level, planned spending increases. The line of planned expenditures E_0 (fig. 2.11) is shifted up to E_1 by a distance ΔG. The equilibrium will be established at point *B*. An increase in government spending will lead to an increase in income ($\Delta Y = Y_1 - Y_0$) greater than the initial change in spending, i.e. $\Delta Y > \Delta G$ and

$$\Delta Y = \Delta G \frac{1}{1 - b(1-t) + n}.$$

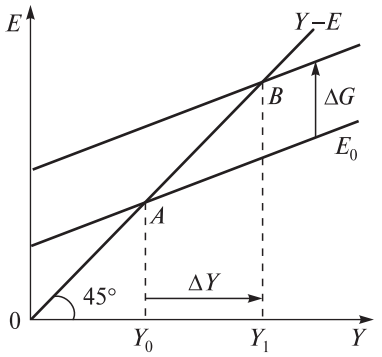

Fig. 2.11. Growth of government spending in the Keynesian Cross model

The ratio

$$\frac{\Delta Y}{\Delta G} = \frac{1}{1 - b(1-t) + n} = m_G$$

is called the **multiplier of government spending** and shows how much revenue will increase with an increase in government spending per unit.

Let's see how the change in taxes affects the equilibrium income level? Let's assume that there was a decrease in autonomous taxes by the amount of ΔT_a. This will immediately increase disposable income by the same amount. Consumption (taking into account the marginal propensity to consume) will increase by $b\Delta T_a$, i.e. at the same level of output (income), planned expenditures will increase by $b\Delta T_a$. The planned expenditure curve will move up by the same amount. The equilibrium income level will increase. The final income growth in the case of a closed economy with only autonomous taxes in accordance with equation $E = C_a + b(Y - T) + I + G = C_a + b_Y - bT + I + G$ is obtained by multiplying the initial increase in autonomous expenses caused by an increase in disposable income by a multiplier:

$$\Delta Y = -b\Delta T_a \frac{1}{1-b}.$$

or

$$\Delta Y = \Delta T_a \frac{-b}{1-b},$$

where $\frac{-b}{1-b}$ is the tax multiplier, or the tax multiplier.

The tax multiplier is smaller in absolute value than the multiplier of government expenditures, since in comparison with the process of multiplying autonomous expenditures in the event of tax changes, there is no first step – income growth due to the growth of autonomous expenditures. All subsequent steps are similar to the case of changes in autonomous expenditures (for example, investments or government expenditures): an increase in disposable income leads to an increase in consumption; an increase in consumption means an increase in spending by the same amount of $b\Delta T_a$; production increases to meet demand – output (income) increases by $b\Delta T_a$. An increase in income will again increase consumer spending, now by $b(b\Delta T_a) = b^2 DT_a$, and increased consumer demand will again lead to an increase in output and income, etc.

Let's see what the tax multiplier will look like, taking into account the full tax function in an open economy. In this case, autonomous expenses

$$\Delta A = -b\Delta T_a,$$

$$A = C_a - bT_a + bTr + I + G + X.$$

When autonomous taxes change, the change in autonomous expenses will correspondingly amount to an increase in the equilibrium level of income caused by a decrease in autonomous taxes, in accordance with the equation will be equal to

$$\Delta Y = -b\Delta T_n \frac{1}{1 - b(1-t) + n}$$

or

$$\Delta Y = \Delta T_a \frac{-b}{1 - b(1-t) + n}.$$

The multiplier of autonomous taxes will be equal to

$$\frac{-b}{1 - b(1-t) + n}.$$

In contrast to the change in autonomous taxes, which is interpreted graphically by shifting the planned expenditure curve by a distance of $b\Delta T_a$, the change in the income tax rate t is graphically reflected by changing the angle of inclination of the planned expenditure curve.

An increase or decrease in transfers, as well as a change in taxes, primarily affects disposable income. Consumption increases by an amount equal to the product of the volume of transfers by the marginal propensity to consume bTr. Further, the process of animation proceeds similarly to the case of tax changes.

The multiplier of transfers is equal to the tax multiplier, but with a positive sign, and the change in the equilibrium income level in this case is equal to

$$\Delta Y = \Delta Tr \frac{b}{1 - b(1-t) + n}.$$

The cumulative change in income in the case of simultaneous changes in government spending, autonomous taxes and transfers can be determined by summing up the changes in each component of autonomous spending multiplied by the corresponding multiplier:

$$\Delta Y = \Delta G \frac{b}{1 - b(1-t) + n} - \Delta T_a \frac{b}{1 - b(1-t) + n} + \Delta Tr \frac{b}{1 - b(1-t) + n}.$$

Note that if for some reason, for example, in anticipation of a recession, households decide to increase savings and consume less, then through the multiplier effect this can lead to a drop in income much greater than a decrease in consumption (while the amount of savings may remain the same or even decrease in the future). This phenomenon has been called the ***"paradox of thrift"***. However, if investments increase at the same time (it is savings that free up resources for investment, limiting consumption), then there will be no decrease in income. The volume of production and employment will remain the same, but the share of investment goods in the output structure will increase and the share of consumer goods will decrease.

QUESTIONS

1. What is aggregate demand and what factors influence it?
2. What is the aggregate supply and what factors influence it?
3. What is the macroeconomic equilibrium? What are its conditions, signs?
4. What is the relationship between the categories "gross income", "total consumption" and "total savings"?
5. How do investments affect the volume of national production?
6. What is the Multiplier of autonomous expenses? Tax multiplier? a multiplier of government spending?
7. What are the government expenditures multiplier and the autonomous taxes multiplier?
8. Which multiplier effect is larger: the multiplier effect of a change in government expenditures or the multiplier effect of a change in autonomous taxes?

3. MONEY MARKET

Basic concepts
Money. Money Supply Monetar.y Aggregates. Liquidity. Money Market. Money Multiplier. Central Bank. Money Multiplier. Reserve rate. Excess reserves. Demand for money. Transactional motive. A precautionary motive. Speculative motive.

3.1. THE CONCEPT OF MONEY. FUNCTIONS OF MONEY AND THEIR LIQUIDITY. MONEY SUPPLY MEASUREMENT. MONETARY AGGREGATES

It is impossible to imagine a modern economy without money. However, today there is no single definition of this concept. Some economists consider money to be a generally accepted means of payment, which is accepted in exchange for goods and services. Others define money as a set of assets used in transactions. Many scientists claim that money is everything that performs the functions of money. They are all right, because money, although obvious, is such a broad concept that it is quite difficult to give its exact definition.

The essence of money is manifested in their *functions.* Historically, the first of them is *a means of circulation (exchange)*. Money performs this function by acting as an intermediary in the exchange of goods. Initially, there was a simple exchange, i.e. goods were exchanged for goods. In this case, the owner of one product had to find the owner of the product he needed, who would be interested in the exchange. Money makes it easy to solve this problem, as people willingly accept it in exchange for goods and services.

The function of the *measure of value is that the prices* of all goods are expressed in monetary units (rubles, dollars). This allows you to compare the relative value of different goods and services, which also simplifies the exchange process. The expression of prices in monetary units allows you to keep records of goods. Therefore, performing the function of a measure of value, money also acts as a unit of account. During periods of high inflation, national monetary units may not perform this function. In such conditions, transactions can be settled in a foreign currency (for example, in dollars), although the transactions themselves are made in the national currency.

Money is a means of *preserving value (a means of saving)*. They perform this function when a commodity producer, having sold his goods and received money, does not use them for purchases for a long time, i.e. saves. This is

due to the property of money to retain its value over time (with the exception of periods of inflation). Thus, money is an asset that can be used to transfer purchasing power from the present period to the future.

The convenience of storing savings in the form of money is explained by their absolute *liquidity*. *Liquidity* is understood as the ability of any asset to turn into a means of payment. The shorter the time spent on this transformation, and the lower the costs of the owner of the asset, the higher the liquidity of the latter. For example, turning securities into a means of payment requires both time and, possibly, payment for broker services. Consequently, the liquidity of securities is lower than that of money. The disadvantage of storing savings in the form of money is that they do not bring profit to their owner.

Money also serves as a *means of payment*. Due to a number of circumstances, economic entities do not always have money at the moment to pay for goods and services. Therefore, there is a need to purchase them on credit, i.e. with deferred payment. First, the goods pass from the seller to the buyer, and then after a certain time, the money from the buyer gets to the seller. When the buyer pays money, they perform the function of a means of payment. Money also performs it when paying wages, repaying loans, etc.

Money performs the function of *world money*. They mediate transactions related to the movement of goods and services across national borders. The role of world money is performed by gold, accepted by weight. Moving from one country to another, world money serves as the universal embodiment of social wealth.

In a modern developed market economy, there are many financial assets that can perform the functions of money with varying degrees of efficiency and reliability. A different combination of these assets is called aggregates of money supply, or monetary aggregates.

The money supply consists of monetary aggregates structured according to the degree of liquidity (M. Friedman).

Monetary aggregates are various indicators of the amount of money used by the central bank of a country.

The criterion for the inclusion of an asset in a certain monetary aggregate is the liquidity of this asset.

Liquidity is the relative ease and speed with which a financial asset performs the function of a means of payment. The higher the transaction costs associated with the purchase of goods and services using this financial asset, the lower the liquidity of this asset.

The amount of money in the country is controlled by the state (monetary, or monetary policy), in practice this function is carried out by the Central Bank.

Monetary aggregates are used to determine the amount of money in circulation. There are five monetary aggregates: M_0, M_1, M_2, M_3, M_4 (L) (in descending order of the degree of liquidity). The composition and quantity of monetary aggregates used vary by country. According to the classification used in the USA, monetary aggregates are presented as follows (from more liquid to less liquid):

– M_0 includes cash outside of banks;

– M_1 – cash outside the banking system, demand deposits, traveler's checks, other check deposits: $M_1 = C + D$, where C is cash and traveler's checks, D is deposits;

– M_2–M_1 plus non-check savings deposits, small term deposits (up to $100,000), one-day repurchase agreements, etc.;

– M_3–M_2 plus large term deposits over 100 thousand dollars, term repurchase agreements, certificates of deposit, etc.;

– M_4 (L) – M_3 plus treasury savings bonds, short-term government obligations, commercial securities, etc.

In macroeconomic analysis, M_1 and M_2 aggregates are used more often than others. Sometimes the cash indicator is allocated (M_0 or C from the English "currency") as part of M_1, as well as the **"quasi-money"** indicator (QM) as the difference between M_2, i.e. mainly savings and term deposits, then $M_2 = M_1 + QM$.

The dynamics of monetary aggregates depends on many reasons, including the *movement of the interest rate*. Thus, with an increase in the interest rate, aggregates of M_2, MOH can outpace M_1, since their components bring income in the form of interest. Recently, the appearance of new types of interest-bearing deposits in M_1 has smoothed out the differences in the dynamics of aggregates caused by the movement of the interest rate.

Monetary aggregates differ in the degree of liquidity decreasing during the transition from Thus, with an increase in the interest rate, aggregates of M_2, MOH can outpace M_0 to Thus, with an increase in the interest rate, aggregates of M_2, MOH can outpace M_4. Monetary aggregates are capable of performing the functions of money to varying degrees. All of them perform the function of preserving value, a means of accumulation. *The only monetary aggregate* that can serve directly and directly as a *means of circulation* is Thus, with an increase in the interest rate, aggregates of M_2, MOH can outpace M_1.

Principles of construction of monetary aggregates:

1. Each subsequent aggregate includes all the previous ones plus some other group of assets (fig. 3.1).

2. As we move from an aggregate with a smaller index to an aggregate with a larger index, the average liquidity of its assets decreases, since moving from

a smaller aggregate to a larger one means consistently including less liquid assets in the money supply.

3. As we move from an aggregate with a smaller index to an aggregate with a larger index, the average return on its assets increases, because the lower the liquidity of the asset, the higher the compensation in the form of interest income should be. Therefore, moving from a smaller aggregate to a larger one means consistently including more and more profitable assets in the money supply.

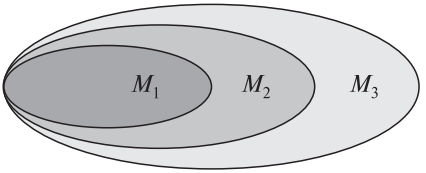

Fig. 3.1. The principle of construction of monetary aggregates

Economists who believe that the main function of money is a medium of circulation consider money only M_1. The remaining monetary aggregates that are not able to perform this function directly and directly are referred to as "almost money".

There is also an empirical approach to identifying money. In practice, central banks operate with aggregates M_2 (Central Bank of the Russian Federation), M_3 (Central Bank of the European Union), M_2 and M_3 (US Federal Reserve System).

In modern conditions, there is uncertainty in the interpretation of money. The boundaries between money and other securities are increasingly blurred.

The purchasing power of credit money is subject to strong fluctuations. Maintaining the stability of monetary circulation involves the use of a number of tools. We are studing the *limiting government spending and eliminating the budget deficit*. The stability of monetary circulation depends on the *size of the supply of goods and services.*

The so-called ***currency management*** (currencyboard) is quite widely used. The Monetary Authority establishes a strict relationship between the *issue of money* and *the availability of gold and foreign currency*. Additional money is provided by an increase in gold-currency reserves. The Monetary Authority restricts the freedom of the state's activities in the financial sphere. Monetary policy is largely determined by the actions of the foreign Central Bank, whose currency is used to stabilize the national monetary system. In this regard, not all countries are ready to use currency management.

Proposals to return to the gold standard system have so far been rejected. However, the functioning of a civilized gold market can increase the level of stability of monetary circulation. Gold purchase and sale operations can increase the reliability of the national currency.

3.2. MAKING MONEY BY THE BANKING SYSTEM. CENTRAL BANK. THE SYSTEM OF COMMERCIAL BANKS. MONEY MULTIPLIER. RESERVE RATE. EXCESS RESERVES. CASHING RATE. MONEY OFFER FUNCTION, ITS GRAPHIC ILLUSTRATION

The movement of money is served by ***the credit system*** – a set of credit relations and institutions that perform specific functions for the accumulation and distribution of temporarily available funds. Currently, the credit system of developed countries consists of three links (levels), the criteria for which are the functional specialization of individual institutions. The highest level is represented by the central bank of the country. The second is by commercial banks. The third level is formed by specialized credit and financial institutions. The central bank together with commercial banks form the banking system.

The banking system is a set of various types of national banks and credit institutions operating within the framework of a common monetary mechanism.

The banking system includes:

– central bank;

– commercial banks;

– special financial institutions;

– united banks (holdings).

In countries with developed market economies, twolevel banking systems have developed. The top level of the system is the central bank. At the lower level, there are commercial banks, subdivided into universal and specialized banks (investment banks, savings banks, mortgage banks, consumer credit banks, industry banks, intra-industrial banks), and non-bank credit and financial institutions (investment companies, investment funds, insurance companies, pension funds, pawnshops, trust companies).

Central to this system is ***the central bank***. The central bank represents the concentration of all credit relations. Modern central banks are characterized by a dual position: on the one hand, their activities are regulated by the state, on the other hand, they have independence in conducting credit policy. The main functions of the central bank are the following: the monopoly right to issue (issue) banknotes, ensuring constant own liquidity; concentration of minimum reserves of commercial banks, providing them with credit support, exercising

control over the activities of commercial banks; regulation of the economy by monetary methods; keeping the government's free cash resources in the form of deposits, transferring to it all its profits in excess of a certain predetermined rate, mediating payments and lending to the government.

All modern central banks are joint-stock. The block of shares may: belong to the state (England, France); be divided between the state and private institutions (Japan, Italy, Scotland); be owned by public (Germany) or private (USA) institutions that are part of the central banking system.

In accordance with the peculiarities of the organizational structure, the central banks of modern developed countries can be divided into banks with an extensive network of branches throughout the country (Australia, England, Finland, France); banks that do not have an extensive network of branches (Japan, Italy, Canada); banks united in a system where one bank is the head bank (USA).

Commercial banks are private (not state-owned) banks that operate on a market basis and carry out a wide range of financial and credit operations: issuing loans and accepting deposits, mediating payments, buying and selling shares, managing property by proxy, placing government loans, advising on financial and credit issues, lease operations (long-term, medium-term and short-term). The main difference between commercial banks and central banks is that they do not have the right to issue banknotes.

Commercial banks are of two types: *universal,* carrying out a wide range of operations, and *specialized,* carrying out one or more banking operations (for example, a savings bank).

The main types of banking operations: active and passive operations, as well as banking services.

Active operations – the provision of loans. By maturity, loans are divided into short-term, medium-term and long-term. Loans from commercial banks are characterized by a great variety. For example, loans to commercial and industrial enterprises are short-term loans to finance the purchase of inventory items. Real estate loans are loans with installment repayment. A personal loan is a consumer loan for the purchase of consumer durables and repaid in instalments. Securities loans are provided to purchase shares and other securities. Agricultural loans are issued to farmers to cover expenses and make investments in agriculture. There are also loans to governments, non-banking financial institutions, foreign banks, and foreign authorities.

Among active banking operations, leasing and factoring operations stand out. *Leasing* is a long-term lease (of buildings, machines, industrial facilities). *Factoring* is a financing system whereby a supplier of goods assigns short-term claims on commodity transactions to a factoring company.

Passive operations – mobilization of monetary savings and income of banks. All deposits in the bank are divided into deposits (any deposit, except for savings) and savings deposit (accumulation of cash savings).

Banking services – cash and non-cash payments, transactions with currency and gold, issue and storage of securities, trust (trust) operations (for example, property management). Banks consult and provide information. In recent years, the volume of banking services has increased significantly. Therefore, the differentiation of banking operations has a certain conventionality.

All types of banking operations are carried out either on a credit (active and passive) basis, allowing you to receive interest; or banking services on a commission basis, i.e. at the expense of its customers and earning a commission. The bank can carry out some operations at its own expense, but receive income: from the purchase and sale of shares, the placement of securities.

Thus, banking operations bring bank profits to the bank. It is defined as the difference between the sum of interest to borrowers (active transactions) and the sum of interest to depositors (passive transactions). In addition to banking profit, the bank's income also includes profit from investments, from exchange operations and commissions (banking services).

Specialized credit and financial institutions. The modern banking system of developed countries includes specialized financial institutions. The main specialized financial institutions include: investment and savings banks, credit unions, insurance companies, pension and investment funds.

Specialized credit and financial institutions accumulate small capitals and savings of wide sections of society, which, through their intermediation, are used for investment in the economy.

The universality of operations, characteristic of both banks and specialized financial institutions, turns the latter into a kind of commercial banks.

The bank, like any other enterprise, the basis idea of its existence is profit. But, if an industrial enterprise produces goods and services, then banks create money.

To understand the mechanism of monetary policy, one should consider the process of forming the money supply, which depends on the policy of the central bank, the activities of commercial banks, and the behavior of other economic entities. The Central Bank issues money and regulates the banking system. Commercial banks influence the money supply because they are able to create new money using existing deposits. Firms and households, making decisions about what part of their savings they will keep in banks and what part they will keep in the form of cash, also participate in the formation of the money supply.

The Central Bank requires commercial banks to keep a certain portion of their deposits as *required reserves*, which must be held either in cash on hand

or in its accounts. It also determines the amount of required reserves as a percentage. This percentage is called the *reserve ratio* (*required reserve ratio*). The difference between all the bank's reserves and the required reserves is *the excess reserves*. It is their volume that determines the possibilities of creating money by the banking system. Consider the process of creating money by commercial banks under the following conditions:

– only changes are reflected in banks' balance sheets;

– there are only demand deposits;

– the rate of mandatory reserves for all banks is the same and equal to 10 %;

– the reserves maintained by banks are equal to the mandatory ones, they are in their accounts with the central bank;

– banks fully use the excess reserves that have appeared to issue loans to one person.

The easiest way to receive a deposit by a commercial bank is to deposit cash into a bank. Suppose an economic entity invests 1,000 thousand rubles in a bank.

This transaction will be reflected in the bank's balance sheet:

Bank A

Assets	**Liabilities**
Reserves: +1000 thousand rubles	Deposits: +1000 thousand rubles

Part of its reserves (100 thousand rubles.), Bank A must keep on the accounts of the central bank as mandatory. He will use the other part (900 thousand rubles), since storing excess reserves will not bring him income. According to the agreed conditions, the bank gives 900 thousand rubles. in a loan to one person – an economic entity. As a result, the balance of Bank A will take the following form:

Bank A

Assets	**Liabilities**
Mandatory reserves: +100 thousand rubles Loans: +100 thousand rubles	Deposits: +1000 thousand rubles

Thus, on the accounts of bank A there are deposits for 1000 thousand rubles and a loan for 900 thousand rubles. The total amount of money available on the accounts is 1900 thousand rubles. Before that, the money supply corresponded to the deposit amount and amounted to 1000 thousand rubles. Therefore, bank A increases the money supply by 900 thousand rubles. Let's assume that, having received a loan, an economic entity used it to pay for raw materials, putting money into the supplier's account at bank B. The latter,

having received a deposit, will also leave a reserve of 10 %, and will give the rest of the money to a loan. Thus, the balance of Bank B, which reflects only the changes, will be as follows:

Bank B

Assets	**Liabilities**
Mandatory reserves: +90 thousand rubles Loans: +810 thousand rubles	Deposits: +900 thousand rubles

So, Bank B has created an additional 810 thousand rubles. The loan received can be used by another entity, for example, to pay for the repair of a house of a construction company. This money will replenish the reserves of Bank B, which will act in the same way as other banks. As a result, its balance will have the following form:

Bank B

Assets	**Liabilities**
Mandatory reserves: +81 thousand rubles Loans: +729 thousand rubles	Deposits: +900 thousand rubles

Bank B creates an additional 729 thousand rubles of credit money. The process of creating money continues until almost the entire amount of the initial deposit is used as mandatory reserves.

As can be seen from the example, the ability of banks to create money is determined by the norm of mandatory reserves: the larger it is, the less money will be created. Theoretically, with a reserve rate of 10 %, each monetary unit invested in the bank will lead to a tenfold increase in the amount of money. Conversely, each monetary unit withdrawn from the bank will cause a tenfold reduction in the money supply, i.e. there is a multiplier effect. The bank (deposit) multiplier is calculated by the formula

$$m = \frac{1}{rr} \cdot 100\,\%,$$

where rr – is the rate of mandatory reserves; m – is the maximum amount of money that can be created by one monetary unit for a given amount of years.

To determine the total amount of money MS_1 that has arisen as a result of the appearance of a new deposit D_1 can be as follows:

$$MS_1 = mD_1 = \frac{1}{rr} D_1.$$

So, the possibilities for commercial banks to create new money depend both on the total amount of deposits and on the rate of mandatory reserves.

However, in the latter case, the fact that banks can keep reserves exceeding the mandatory ones is not taken into account. The reason for this is usually security considerations related to the unpredictability of depositors' demand for money. If the bank does not have the amount of money required by the depositor, he will have to borrow funds from the central bank, other commercial banks, sell securities, i.e. bear certain costs. Therefore, when solving the problem of excess reserves, the bank should take into account both the lost percentage of their storage and the costs that it will have to pay for the loan in case of a shortage of money.

Recently, there has been a tendency to decrease the amount of excess reserves, since, firstly, bank deposit insurance has reduced the risk of unexpected mass withdrawals of money by depositors; secondly, high loan interest has made losses from storing excess reserves too expensive. If we denote the volume of all reserves held by banks, determined by both the policy of the central bank and the decisions of commercial banks themselves, by R, then the ratio between it and deposits (i.e., *the reserve rate*, *rd*) will be equal to

$$rd = \frac{R}{D}.$$

The supply of money is also affected by the ratio of cash and deposits, which depends on the decisions made by economic entities. Each of them independently determines which part of the money to keep in cash, and which to put in the bank. A number of factors influence his choice. Firstly, the higher the fluctuations in GDP, the more money the population will hold in their hands. Secondly, the amount of cash depends on the loan interest rate, because the storage of cash deprives its owners of income. Therefore, the higher the loan interest rate, the less cash economic entities will have. Thirdly, the amount of cash depends on the complexity of their withdrawal from the bank, i.e. transaction costs. The ratio of cash to deposits (*deposit ratio*, *cd*) will be

$$cd = \frac{CU}{D},$$

where CU is cash.

To determine the monetary multiplier taking into account rd and cd, we introduce the concept of a monetary base. *The monetary base* (high efficiency money, strong money) is equal to the amount of cash in circulation and bank reserves:

$$MH = CU + R.$$

As you know, in economic theory, the monetary aggregate M_1 is mainly considered. Therefore, the money supply *MN* is defined as the sum of cash *CU* and demand deposits *D*.

The monetary base is smaller than the supply of money, because banks are able to create new money. To determine the monetary multiplier, we divide the *MS* money supply by the monetary base:

$$\frac{MS}{MH} = \frac{CU + D}{CU + R}.$$

We transform this expression by dividing both the numerator and the denominator by the cost of deposits *D*. We obtain the following equation:

$$\frac{MS}{MH} = \frac{\frac{CU}{D} + 1}{\frac{CU}{D} + \frac{R}{D}} = \frac{cd + 1}{cd} + rd.$$

Therefore,

$$MS + \frac{cd + 1}{cd + rd} \cdot MH,$$

where $\frac{cd + 1}{cd + rd} = mm -$ is money multiplier.

Thus, the money supply will be equal to

$$MS = mm \cdot MH.$$

The resulting equation is called the money supply function. It shows that for every monetary unit of increase in the monetary base, there are mm units of increase in the supply of money. Consequently, the supply of money is directly dependent on the size of the monetary base and the multiplier. The latter, in turn, is determined by the ratio of cash to cd deposits and reserves to rd deposits. The growth of cd leads to a decrease in the money multiplier: it means an increase in the volume of cash and a reduction in deposits, which reduces the possibility of the banking system creating new money. This is also understandable from an arithmetic point of view, given that $cd < 1$. From the definition of the monetary multiplier, it follows that an increase in rd leads to an increase in the denominator and a decrease in the monetary multiplier. Indeed, the larger the part of deposits that commercial banks use as reserves, the less new money they can create. Accordingly, a decrease in cd and rd leads to an increase in the money multiplier and an increase in the supply of money. The multiplier value depends on the behavior of three different types of economic entities: the central bank, which sets the rate of mandatory reserves; commercial banks, which decide how much money to hold as reserves; the population, which determines the structure of the money supply taking into

account interest rates, inflation and other variables. The ratios between cash and deposits, bank reserves and deposits are volatile and beyond the total control of the central bank. Therefore, he is not able to determine exactly what the money multiplier will be. The central bank can control the monetary base, influence the multiplier with the help of monetary policy instruments, but it is not able to reliably determine the supply of money. Based on this, we can say that the supply of money is a variable. It is directly dependent on the level of the interest rate, since its increase leads to a decrease in excess reserves, a reduction in cash and an increase in deposits, which increases the money multiplier and the supply of money, and vice versa.

The changes in the multiplier reflect the behavior of three different types of economic entities: the central bank, which sets the rate of mandatory reserves; commercial banks, which decide how much money to hold as reserves; the population, which determines the structure of the money supply taking into account interest rates, inflation and other variables. The ratios between cash and deposits, bank reserves and deposits are volatile and are not fully subject to the control of the central bank. Therefore, to determine exactly what the money multiplier will be. The central bank can control the monetary base, influence the multiplier with the help of monetary policy instruments, but it is not able to accurately determine the supply of money. Therefore, the supply of money is a variable quantity. It is directly dependent on the level of the interest rate, since its increase leads to a decrease in excess reserves, a reduction in cash and an increase in deposits, which increases the money multiplier and the supply of money, and vice versa. The money supply curve will have an ascending form.

The money supply is the money supply in circulation, i.e. all the money that has left the banking system and is in the hands and accounts of people.

In the short term, the value of the money supply in the country, i.e. the supply of money, is a fixed value. In this regard, the money supply curve, which characterizes the dependence of the money supply on the interest rate, is a vertical straight line (fig. 3.2).

In some cases, when there is a sensitivity of society to fluctuations in the nominal interest rate, as well as when commercial banks react to changes in the interest rate, the money supply curve may be an increasing function, but the probability of this event is low.

In the long term, the shape of the money supply curve, which characterizes the dependence of the amount of money in the country on the price of money (interest rate), depends on the tactical goals of the Central Bank.

The tactical goals of the Central Bank characterize the bank's intentions to respond in some way to changes in the demand for money.

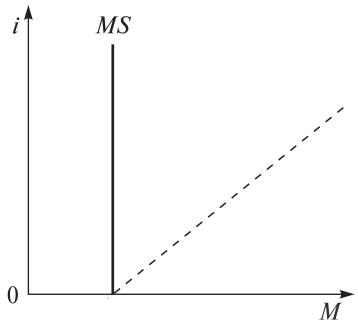

Fig. 3.2. Money supply curve

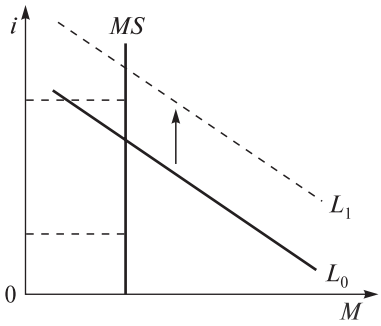

Fig. 3.3. The money supply curve in a tight policy environment

1. The curve of money supply in a tight policy environment (fig. 3.3).

If the tactical goal of the Central Bank is to preserve the immutability of the money supply (*M*) when the demand for money changes, then the money supply curve in the long term will be vertical. In this case, we are talking about a strict credit policy.

Such a policy is carried out when the Central Bank believes that a change in demand for money is associated with a change in the price level (*p*) and in order to contain inflation, it is necessary to keep the money supply unchanged. As a result, an increase in the demand for money will determine an increase in the interest rate.

2. The money supply curve in a flexible policy environment (fig. 3.4).

If the Central Bank's goal is to keep the price of money unchanged (interest rate *i*), then in response to a change in demand for money, the bank will change the supply of money. In this case, the long-term money supply curve will be horizontal. In such a situation, the Central Bank pursues a flexible policy.

This policy takes place if the government believes that the growth in demand for money is associated with an investment program aimed at increasing real national income, and in order for the economic recovery to continue, it is necessary to maintain a low interest rate unchanged.

3. The money supply curve in the conditions of intermediate policy (fig. 3.5).

If the tactical goal of the Central Bank is to maintain a certain rate of growth of the money supply in response to changes in demand for money, then the Central Bank increases the money supply with an increase in demand for money, but to a lesser extent than is necessary to maintain an unchanged interest rate.

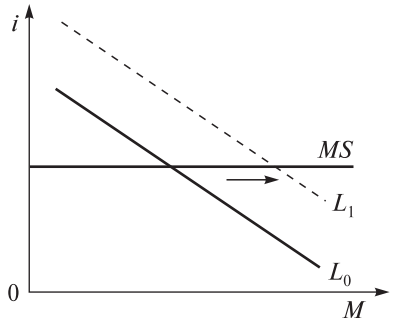

Fig. 3.4. The money supply curve in a flexible policy environment

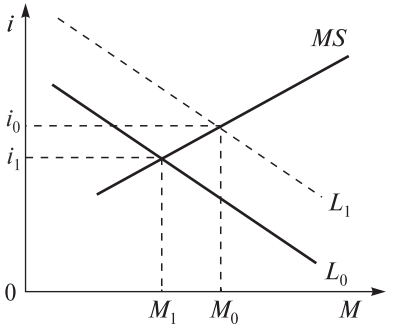

Fig. 3.5. The money supply curve in the conditions of intermediate policy

In this case, the money supply curve will have a positive slope in the long term. This policy is called "intermediate" and can be applied if a change in the demand for money is generated by a change in the speed of money circulation and an increase in national income.

The Central Bank can change the money supply in the country either by changing the monetary base, which is the preferred action, or as a result of influencing the value of the monetary multiplier.

3.3. DEMAND FOR MONEY. TRANSACTIONAL MOTIVE. THE MOTIVE OF PRECAUTION. SPECULATIVE MOTIVE. MONEY DEMAND AND PRICE LEVEL. MONEY DEMAND FUNCTION, ITS GRAPHIC ILLUSTRATION

There are various concepts of the demand for money. Let's consider those of them that are related to the motives for keeping money defined by J. Keynes. Keynes distinguished *three motives of demand for money*: transactional (operational), precautionary and speculative.

The transactional motive of the demand for money. It is connected with the fact that money is needed by economic entities to pay for goods and services (trade transactions). This motive is due to the performance of money as a means of circulation. The classical analysis of the demand for money is limited to the transactional motive. It is based on the quantitative theory of money. Its essence was expressed by I. Fischer, through that the following equation:

$$M \cdot V = P \cdot Q,$$

where M is the amount of money in circulation; V is the speed of money circulation (the average number of times a year that each monetary unit in circulation is used to purchase goods and services); P is the price level in society; Q is the real volume of national production.

$P \cdot Q$ can be considered as nominal gross output in the economy, or nominal GDP. Then

$$M = \frac{PQ}{V}.$$

At equilibrium in the money market, the amount of money M in circulation is equal to the amount of demand for money. Denote it MD, hence:

$$MD = \frac{PQ}{V}.$$

Fischer argued that the speed of money circulation is determined by the density of the population; by what economic entities use more when paying for their purchases: checking accounts or cash, etc. In view of the immutability of the above conditions, he considered the speed of money to be constant. However, from the above formula, we see that the demand for nominal cash balances is directly proportional to the nominal volume of national output and inversely proportional to the speed of money circulation.

Representatives of the Cambridge School (A. Marshall, A. Pigou, D. Robinson) believed that, in general, the Fisher equation is correct, but it takes into account only one type of financial assets – money. They considered the demand for money from the point of view of portfolio analysis, which was then widely used by monetarists.

A portfolio is a set of assets of an economic entity. Money is only one of the assets that has both its advantages and disadvantages. Cambridge School economists argued that the amount of money that each economic entity holds in its portfolio is determined by two factors. On the one hand, money is a liquid asset, which facilitates business transactions. On the other hand, they do not generate income like, for example, securities. If we denote by the letter k the part of assets that economic entities prefer to keep in the form of money, then the Cambridge School equation will have the form

$$M = k \cdot P \cdot Q.$$

The coefficient k (liquidity indicator) is inversely proportional to the speed of money circulation: the less liquidity (less cash), the greater the speed of their circulation.

Cambridge School scientists considered k as a constant value. They, like Fischer, believed that the demand for money ($MD = M$) is directly proportional

to nominal GDP. At the same time, they argued that economic entities themselves decide how much money they save, and their decisions depend on the expected profitability of other assets. When the yield of the last k changes in the short term, it may change.

The motive of precaution is in the demand for money

The demand for money for the motive of precaution is explained by the possibility of unforeseen purchases, expenses. The reserve of money allows economic entities to insure against insolvency. On the one hand, the more money economic entities keep for precautionary reasons, the greater their losses will be, measured in the form of a nominal interest rate that money could bring. On the other hand, the lack of the necessary amount of money at the right time can lead to the fact that economic entities will have to sell other assets, resort to loans, i.e. incur significant costs. Economic entities in this case must determine the optimal amount of money needed for precautionary purposes. This will be the amount that will provide a balance between the losses associated with storing money and the costs associated with acquiring the necessary amount of money.

This demand for money is the demand for real cash balances, since if the prices of goods and services rise twice, then economic entities will save twice as much money as a precaution. Naturally, the larger the volume of real GDP, the greater the demand for real cash balances, i.e. the demand for money, due to the motive of precaution, is directly proportional to the real volume of national production (income). However, the higher the interest rate, the less demand there will be for real cash balances: it is inversely proportional to the nominal interest rate. The factor influencing this demand for money is also the degree of uncertainty in the economy. An increase in uncertainty leads to an increase in the amount of money saved.

The speculative motive of the demand for money

It is conditioned by the money performing the function of saving savings. To prove its existence, Keynes considered a portfolio consisting of two assets. The first one – money (cash plus interest-free checking deposits) – has absolute liquidity, but does not bring income. The second asset-long-term government obligations (bonds) – generates income in the form of interest, the level of which, according to Keynes, is determined on the securities market. Moreover, Moreover, there is a dependence: the higher the bond rate, the lower the level of its yield. Let's say, for example, there is a bond with a nominal value

of $1,000, the income is 5 %. An annual income of $50 is expected. If the interest rate on the market has increased to 10 % per annum (for example, new bonds have been issued at the rate of 10 % per annum), then a new bond with a nominal value of $500 will bring the previous income of $50. In the market, the rate of the old bond will also drop to $500. This means that an economic entity will "lose" part of its capital.

Keynes believed that every economic entity has its own opinion about the "normal" level of interest rates. He keeps track of which way the market interest rate deviates from it. If the market rate is more than "normal", then he assumes that it may decrease, and this will cause an increase in the bond rate. Therefore, with a high market interest rate, an economic entity increases the demand for bonds and, accordingly, reduces the demand for money. Conversely, if the market interest rate is less than "normal", then it is likely that it will rise, and this will lead to a decrease in the bond rate and a loss of capital. Therefore, with a low interest rate, economic entities prefer to increase the demand for money and reduce the demand for bonds. This means that the demand for money is inversely dependent on the level of the nominal interest rate.

If the market interest rate reaches a certain minimum level at which the income from bonds as a financial asset will be insufficient to compensate for the risk associated with investing money in them, there will be an "absolute preference for liquidity". This means that everyone will prefer money to bonds.

Other economists have tried to give a more complete justification for the speculative motive of the demand for money. So, Tobin believed that when determining the structure of the portfolio, not only the profitability of the asset is important, but also the risk associated with it. As a rule, the higher the yield of an asset, the greater the risk. Most economic entities do not like to take risks and prefer an asset with a lower yield if its risk is lower. Money does not generate income, but it is a safe asset. Investments in bonds, on the contrary, are associated with risk. Therefore, even if the yield of bonds is higher than the yield of money, economic entities may prefer to store wealth in the form of money. The desire to avoid risk generates a demand for such a safe asset as money.

Consequently, the demand for money, due to a speculative motive, is explained by the fact that an economic entity reserves some reserve for the purpose of the most profitable option, depending on market conditions, to preserve its capital, as well as the security of such an asset as money. It is determined by the real volume of the national product (the greater the income of the society, the greater the absolute value of savings) and the level of the nominal interest rate.

The curve of real demand for money

The analysis of the demand for money showed that the real demand for money (demand for real cash balances), determined by a set of motives, is directly dependent on the real volume of national production (income) and inversely – on the level of the nominal interest rate. The nominal demand for money is also influenced by the price level: the higher the price level in the country, the greater the nominal demand for money.

If we take the real volume of national production unchanged, then the curve of real demand for *MD* money will have the following form (fig. 3.6).

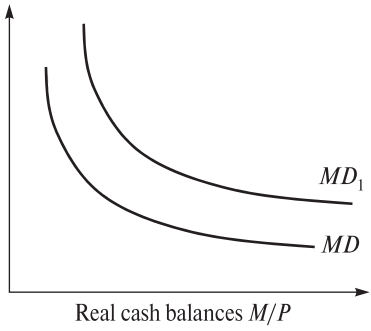

Fig. 3.6. Money demand curve

When the interest rate *i* changes, the amount of demand for money will change and the equilibrium point will move along the demand curve *MD*. When the real volume of national production changes, the demand for money itself will change and the *MD* curve will move to the right or to the left. For example, an increase in the volume of real GDP may lead to a shift of the *MD* curve to the MD_1 position.

3.4. EQUILIBRIUM IN THE MONEY MARKET. THE INTERACTION OF SUPPLY AND DEMAND IN THE MONEY MARKET. EQUILIBRIUM INTEREST RATE. ALGEBRAIC REPRESENTATION OF THE *LM* LINE. LINE SHIFT FACTORS *LM*

The optimal state of the money market for the economy is when the demand for money is equal to its supply. We will consider the equilibrium of the money market, provided that the price level and the real volume of national production (income) remain unchanged. The *MD* money demand curve will be descending (fig. 3.7).

Classical theory, J. M. Keynes assumed that the central bank completely controls the supply of money and in the short term it is constant. Considering the equilibrium of the money market, we will also accept the money supply unchanged, since the central bank determines the required amount of money

for a given year based on the state of the country's economy and regardless of the interest rate level. Then the *MS* supply curve will have the form of a vertical straight line (see fig. 3.7). The equilibrium of the money market will occur at point E – the point of intersection of the supply and demand curves. It determines the equilibrium loan interest rate i_E.

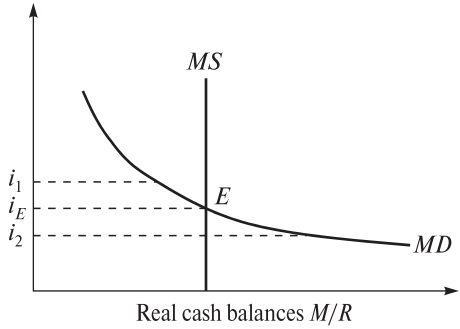

Fig. 3.7. Money market equilibrium

Let's prove that i_E is the equilibrium rate, i.e. with any other value of the interest rate, equilibrium in the money market is impossible. Let's say the interest rate is set at the level of $i_1 < i_E$ (see fig. 3.7). With a low interest rate, economic entities will prefer to keep more money. Since the supply of money is invariable, they can achieve this only by selling other assets (stocks, bonds, etc.). The sale of securities will be accompanied by a decrease in their exchange rate and an increase in the interest rate.

Economic entities will also try to get money by applying for loans from banks. With a constant supply of money, each individual bank can satisfy the increased demand for money only by applying for loans to the central bank or to the interbank market, where commercial banks provide loans to each other (in the US, this is the federal reserve funds market). Competition between banks will lead to an increase in the interest rate in this market as well. As the interest rate rises, the demand for money will decrease until the money market returns to a state of equilibrium at the rate.

On the contrary, with a high interest rate $i_2 > i_E$ (see fig. 3.7) assets such as bonds and stocks will become more attractive. The demand for securities will increase, which will lead to an increase in their exchange rate and a decrease in the interest rate. Commercial banks, in turn, will try to get rid of excess reserves by offering them on the interbank market. An increase in the supply of funds on the interbank market will lead to a reduction in the interest rate.

As it decreases, the demand for money will increase, which will restore the balance of the money market. From this we can conclude: only at the interest rate i_E, the money market is in an equilibrium state.

The supply and equilibrium of the money market

The equilibrium of the money market may be disturbed due to changes in the supply of money or demand for them.

Consider the reaction of the money market to a change in the supply of money. Let's assume that initially it was in equilibrium at point E_1 at the interest rate i_x and the money supply MS (fig. 3.8).

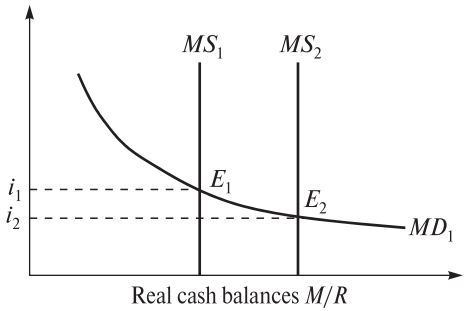

Fig. 3.8. Changes in the money supply and the equilibrium of the money market

The central bank, trying to boost business activity, increased the supply of money during the recession, which led to the shift of MS to the position of MS_2. An increase in the supply of money means an increase in the excess reserves of commercial banks. In order not to incur losses from their storage, banks will try to use excess reserves by lending them to economic entities, offering them on the interbank market, buying securities. Competition between commercial banks seeking to "attach" excess reserves will lead to lower interest rates in all financial markets. This will also be facilitated by the actions of economic entities that, having received "excess" money, will try to get rid of them by buying securities.

An increase in demand for stocks and bonds will lead to an increase in their market rate and a decrease in the interest rate. As the interest rate decreases, the demand for money will increase, which will move the equilibrium point down the demand curve. A new equilibrium position will occur at point E_2 at a lower interest rate i_2.

Now suppose that, in an effort to reduce the rate of inflation, the central bank decided to reduce the supply of money. As a result, the money supply curve MS_2 took the position of MS_1 (see fig. 3.8). A decrease in the supply of money will lead to a shortage of reserves in commercial banks. They can find the necessary funds by applying for loans on the interbank market, demanding the return of loans issued on demand, selling securities. These actions will lead to an increase in the interest rate. Assets such as bonds and stocks will start to become more preferable. The demand for money will begin to decrease, which will lead to a movement along the demand curve from point E_2 to point E_1. The new equilibrium will be established at point E_1 at a higher interest rate – i_1.

The demand for money and the equilibrium of the money market

Let us now analyze how the change in the demand for money affects the equilibrium of the money market. Let's assume that the market was in equilibrium at point E_1 (fig. 3.9). The equilibrium interest rate was equal to i_1 and the demand for money was MD_1.

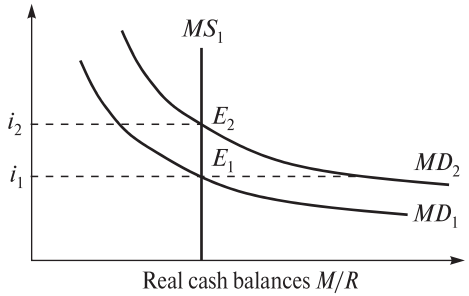

Fig. 3.9. Changes in demand for money and the equilibrium of the money market

GDP growth has led to an increase in demand for money and, accordingly, to a shift of the MD_1 curve upwards to the MD_2 position. At the current interest rate, the demand for money will exceed its supply. Since the money supply has not changed, economic entities can receive additional funds by selling securities or applying for loans from banks. The latter will try to increase their reserves due to loans received on the interbank market, the sale of securities. The result of such actions will be an increase in the interest rate to the i_2 level. Consequently, with a fixed supply of money, an increase in the demand for money will lead to

an increase in the equilibrium interest rate. The new equilibrium of the money market will be reached at the point E_2 of the money market.

If the demand for money decreases, everything will happen in the opposite order. Let's say the decline in production caused a reduction in demand for money and a shift of the MD_2 curve down to the MD_1 position. At the i_2 interest rate, the demand for money will be less than its supply. Banks will try to use their excess reserves by buying securities and providing loans. Economic entities, whose assets will have more money than the amount they need, will also try to use the "extra" money, repaying previously taken loans, buying securities. The simultaneous efforts of banks and economic entities will lead to a reduction in the loan interest rate. A new equilibrium of the money market will occur at point E_1 at a lower interest rate i_1.

Thus, a change in the interest rate restores equilibrium in the money market.

The main tool in analyzing the processes occurring in the money market and arising from its interaction with other macroeconomic markets in the Keynesian concept is the ***LM curve***. It represents the set of all combinations of real national income and interest rates at which equilibrium exists in the money market.

The *LM* curve ("liquidity preference – money") shows all possible ratios of *Y* and *r*, in which the demand for money is equal to the supply of money. The term *LM* reflects this equality: *L* stands for liquidity preference, a Keynesian term for money demand, and *M* stands for money supply.

The construction of the *LM* curve is based on the Keynesian theory of liquidity preference, which explains how the supply and demand ratio of real cash reserves determines the interest rate. Real cash reserves are nominal reserves adjusted for changes in the price level and are equal to *M*/*R*. According to the theory of liquidity preference, the supply of real cash is fixed and determined by the central bank. Consider the construction of the *LM* curve based on a graphical analysis of the equilibrium of the money market.

In fig. 3.10, the money supply curve is a vertical line corresponding to a given real amount of money in the economy. The intersection of the demand curve with the money supply curve gives us the interest rate r_1, which balances the money market at a given income level Y_1. If income increases to the Y_2 level, then the money demand curve will shift to the right, a higher income level corresponds to a higher equilibrium interest rate r_2. The totality of all pairs (*Y*, *r*) that balance the money market will give us the *LM* curve.

Just as the economy tends to the equilibrium points lying on the *IS* curve, it also tends to the equilibrium points defined by the *LM* curve (fig. 3.11). If the economic situation corresponds to the point to the left (top) of the *LM*

curve (point *A*), then we can talk about an oversupply of money. People have more money than they want to have. In order to get rid of the "extra" money, they will, for example, buy bonds, this will entail an increase in bond prices and a decrease in interest rates. With an oversupply of money, the interest rate will fall until it reaches the equilibrium level set by the *LM* curve.

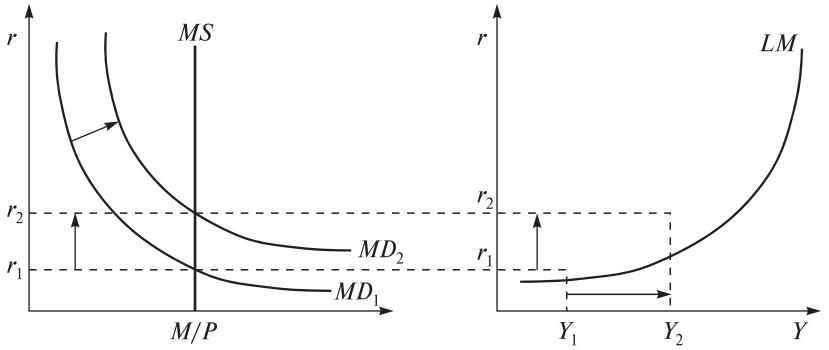

Fig. 3.10. Graphical output of the *LM* curve (the first method)

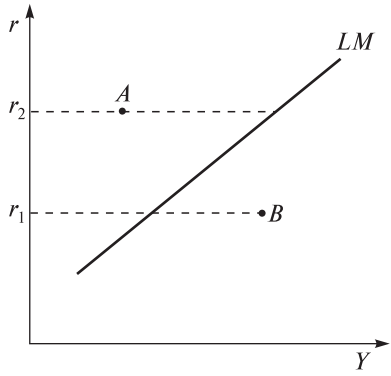

Fig. 11. LM curve

If the economy is described by a point on the right (bottom) from the *LM* curve, then we can talk about excessive demand for money. At point *B*, people want to have more money than they have. To do this, they will sell bonds, thereby reducing their price and increasing the interest rate. This process will continue until the interest rate rises to the equilibrium level determined by the point on the *LM* curve.

Let's consider an alternative way of constructing the LM curve. Let s assume that the volume of money supply and demand for them for transactions does not depend on the interest rate (fig. 3.12).

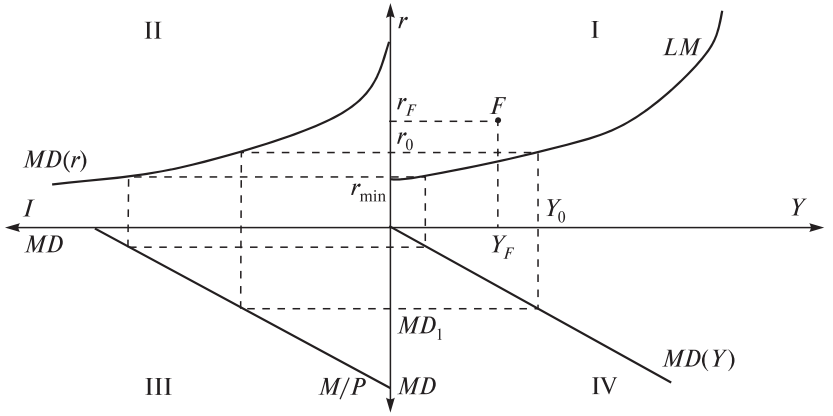

Fig. 3.12. Graphical output of the *LM* curve (second method)

Quadrant II shows a graph of the demand function for money from assets, and quadrant IV shows a graph of the demand function for money depending on income (the demand for money for transactions). In quadrant III, a straight line shows how a given real amount of money can be distributed between the demand for money from assets and the demand for money for transactions. Based on these lines, a set of combinations of *r* and *Y* corresponding to the equilibrium in the money market is determined in the quadrant I.

If we take into account that the supply of money and the demand for them for transactions may depend on the interest rate. In this case, the construction of the *LM* curve becomes more complicated, since each interest rate corresponds to its own lines in quadrants III and IV.

Thus, the *LM* curve describes all combinations of interest rates and aggregate output at which the money market is in equilibrium. The points lying above the *LM* line correspond to an excess of money supply, as can be seen by considering, for example, point *F*. In order for the income of Y_F, the demand for money equals their supply, the r_F interest rate is needed. Point *F* corresponds to a higher interest rate at which the demand for money from assets is less than required for the full use of the amount of money offered. By means of similar reasoning, one can make sure that in the area located below the *LM* line, the volume of demand for money is greater than its supply.

It should be noted that the *LM* curve, as well as the *IS* curve, does not express the functional dependence of national income on the interest rate or vice versa, but defines all possible combinations of combinations of equilibrium values of income and interest rate.

Simple algebra of the *LM* curve. The equation of the *LM* curve can be obtained by solving the equation $\frac{M}{P} = e \cdot Y - f \cdot r$ with respect to *r*. The equation of the *LM* curve with respect to r has the form: $r = \frac{e}{f} = Y - \frac{1}{f} \cdot \frac{M}{P}$. The equation of the equilibrium interest rate shows the value of the rate that gives equilibrium in the money market for any value of income and the value of the real money supply. Along the *LM* curve, the value of the real money supply is fixed.

Since the $\frac{e}{f}$ coefficient characterizing the slope angle of the curve is positive, the *LM* curve has a positive slope and reflects a direct relationship between the income level and the interest rate. A higher income determines a higher demand for money, which leads to a higher interest rate. The slope of the LM curve depends on two parameters: the sensitivity of the demand for money to the income level (*e*) and the sensitivity of the demand for money to the interest rate (*f*). The *LM* curve will be flatter if: the sensitivity of the demand for money to changes in the interest rate is high. This means that even a slight change in the interest rate leads to a significant change in the demand for money; the sensitivity of the demand for money to changes in income is small. A significant change in income causes a slight change in the demand for money.

Two factors can lead to a shift in the *LM* curve: a change in the demand for money and a change in the supply of money.

Consider, for example, the growth of money supply at a given price level and a fixed volume of output at the Y_A level (fig. 3.13).

In fig. 25, *b* shows the demand curves *MD* and money supply MS_1, and the point of their intersection (point *A*) determines the initial level of the interest rate r_1. Suppose that the central bank increases the supply of money by buying securities on the open market. At a fixed income level, an increase in the amount of money shifts the money supply curve to the MS_2 position, and the equilibrium interest rate drops to the r_2 level. In fig. 3.13, *a* decrease in the equilibrium rate from r_1 to r_2 corresponds to the shift of the equilibrium from point *A* to point *A′* and the movement of the curve from position LM_1 to position LM_2 (lower and to the right).

In fig. 3.14 the shift of the *LM* curve is caused by a change in the demand for money for exogenous reasons at a given price level and a fixed output

volume at the Y_A level. Consider point A on the original curve LM_1. Let's assume that there was a financial crisis in the economy, which caused many companies to go bankrupt. As a result of the fact that securities have become riskier assets, people have a desire to have more money. This increase in demand for money at a fixed income level is shown in fig. 3.14, *b* by shifting the money demand curve from the MD_1 position to the MD_2 position. The new equilibrium in the money market shows that the equilibrium interest rate will increase to the r_2 level, and the equilibrium point will shift from point A to point A'. With the growing demand for money, the LM curve in fig. 3.14, *a* is shifted from the LM_1 position to the LM_2 position (up and to the left).

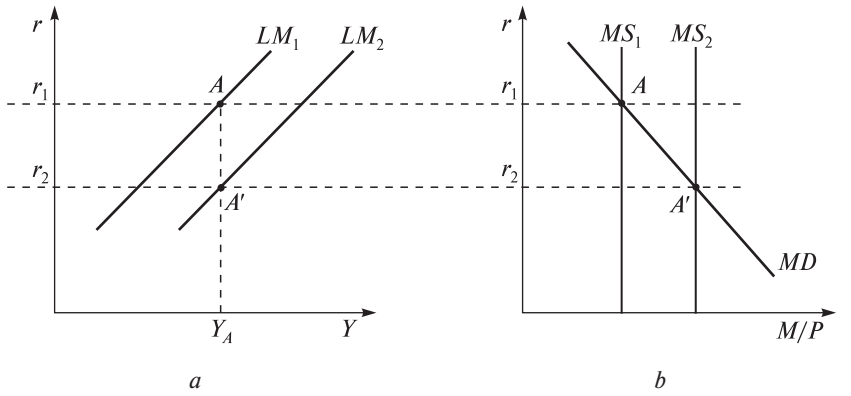

Fig. 3.13. Shift of the LM curve (increase in money supply)

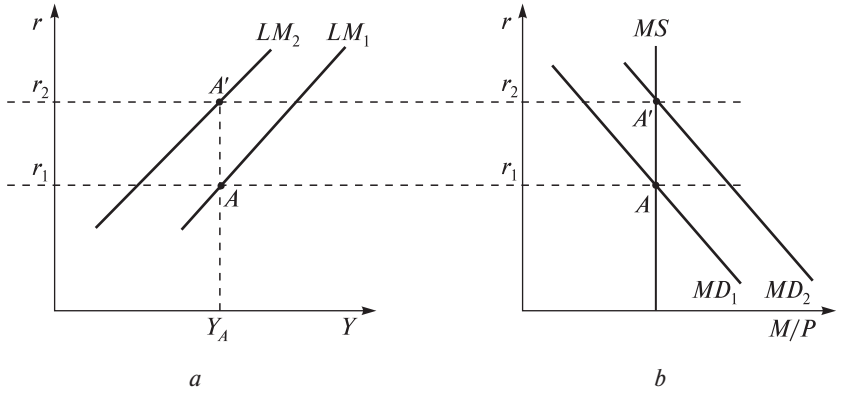

Fig. 3.14. Shift of the LM curve (increase in demand for money)

QUESTIONS

1. How do changes in the price level influence the multiplier effects of fiscal policy on real GDP?
2. What is the long-run fiscal multiplier effect on real GDP and the price level?
3. How do income taxes and payroll taxes influence the labour market, and how would a cut in these taxes influence real GDP?
4. How would an income tax cut influence aggregate supply and aggregate demand?
5. How would an income tax cut influence real GDP and the price level?

4. JOINT EQUILIBRIUM IN THE MARKETS OF GOODS AND SERVICES AND MONEY (*IS–LM*-MODEL)

Basic concepts
Investment trap. *IS* curve. *LM* curve. Liquidity trap. *IS–LM* model. Crowding out effect.

4.1. THE CONDITIONS OF JOINT EQUILIBRIUM. EQUILIBRIUM VALUES OF OUTPUT AND INTEREST RATES

Wifh the publishion of the work J. Keynes the *IS–LM* model was proposed. J. Hicks tried to combine the money market and the goods market into one model and show how the neoclassical and Keynesian approaches complement each other. In 1949, E. Hansen's book "Monetary Theory and Fiscal Policy" was published, which the proposion of widespread use of the *IS–LM* model in economic analysis.

J. Hicks considered the economy in terms of fixed prices. The volume of production, and hence the supply of goods, is absolutely elastic, i.e. firms are able to offer as many goods as they are requested. Consumption depends solely on income, investment is a simple function of the interest rate. Since nominal wages W are considered constant, and prices P are unchanged, then real wages will be constant ($w = W/P$). There is a sufficient amount of unoccupied resources (including labor), and therefore changes in income in the *IS–LM* model lead to significant fluctuations in the level of use of these resources. Government spending, taxes, money supply are considered as variables set from outside the model (exogenous variables), the economy is considered as a closed model (there is no foreign trade in such a model). Hicks tried to find out what factors lead to changes in the volume of GDP.

The market of goods and services in the framework of the *IS–LM* model is described through the "savings–investments" equation. Hicks proceeded from the basic macroeconomic identity in a closed economy

$$Y = C + I + G.$$

For the analysis, the Keynesian function of consumer spending C was used, characterized by a direct dependence on the value of disposable income

$$C = C_a + MPCY.$$

The investment function considers autonomous investments and characterizes the inverse dependence of the volume of investments on the interest rate

$$I = I_a - dr,$$

where r is the interest rate; d is the coefficient showing the sensitivity of changes in the volume of investments to changes in the interest rate. The volume of public procurement is considered a constant value set from the outside. Based on the above equations, the basic macroeconomic identity is transformed and solved with respect to Y:

$$Y = C_a + MPCY + I_a - dr + G,$$
$$Y(1 - MPC) = C_a + I_a - dr + G,$$
$$Y = \frac{C_a + I_a - dr + G}{1 - MPC}.$$

The equation IS takes the form

$$Y = \frac{C_a + I_a}{1 - MPC} + \frac{1}{1 - MPC} \cdot G - \frac{d}{1 - MPC}.$$

This equation shows the dependence of the equilibrium volume of GDP on the interest rate, provided that there are no taxes. It can be argued that there is an inverse relationship between the equilibrium volume of GDP and the interest rate, explained by the impact of investment. The lower the interest rate, the greater the volume of investment, and through the multiplier effect this leads to a significant increase in output, and vice versa. The state can influence the volume of GDP by changing the volume of public procurement G, which is a political variable and depends on the state of the economy and the goals of the government.

The IS equation will change somewhat if we take into account that taxes will affect GDP and consumption, i.e. The inclusion of taxes in the system will lead to a change in the consumption function, which will take the form

$$C = C_a + MPC(Y - T).$$

Accordingly, the basic macroeconomic identity will change:

$$Y = C_a + MPC(Y - T) + I_a - dr + G.$$

As a consequence, the equation of the dependence of the equilibrium volume of production and the interest rate will also change:

$$Y = \frac{C_a + I_a}{1 - MPC} + \frac{-MPC}{1 - MPC} \cdot T + \frac{1}{1 - MPC} \cdot G - \frac{d}{1 - MPC} \cdot r$$

equation shows that the equilibrium volume of production depends not only on public procurement, but also on the amount of taxes that the state sets. In addition, there are effects of multiplication in the economy, because the equation includes $K_e = \frac{1}{1 - MPC}$ – government spending multiplier; $K_{tx} = \frac{-MPC}{1 - MPC}$ – tax multiplier.

The effect of multiplier effects allows representatives of the Keynesian school to conclude that the state can actively influence the size of GDP with the help of fiscal policy. Moreover, the effect of its implementation will exceed the volume of direct state intervention as a result of the animation process.

Representatives of Keynesianism attach great importance to the change in the interest rate, because with the help of this mechanism, it is possible to influence the volume of investments and thereby the volume of production. The interest rate itself is formed on the money market. The degree of influence of the interest rate on the volume of GDP is determined by the coefficient at the interest rate – $K_e = \frac{d}{1 - MPC}$.

The coefficient increases, then GDP becomes more sensitive to changes in the interest rate and the *IS* curve becomes steeper. Thus, the slope of the *IS* curve is determined by the position of the investment function and the savings function, i.e. it depends on the magnitude of the marginal propensity to invest at the interest rate, as well as on the marginal propensity to save. The more flat the investment curve and the savings function are, the more flat the *IS* curve will be. The construction of the *IS* curve begins with the quadrant II, on which the investment function is located, depending on the interest rate. On the line of this function, you should take any point E_1. It corresponds to the level of the interest rate r_1 and the volume of investments I_1. The *IS* model reflects the equilibrium state of the economy, and therefore $I = S$. The values of the point E_1 are projected vertically down to the intersection with the bisector $S = I$ in the quadrant III. The coordinates of point E_1 on this graph are equal to: abscissa – I_1, ordinate – S_1. Next, from point E_1 of quadrant III, it is necessary to draw a horizontal line into quadrant *c* to the intersection with the functional savings line S – a point with coordinates is obtained: income – Y_1 and savings – S_1. From the point E_1 of the quadrant IV, a vertical line is drawn up into the quadrant I. It turns out the point E_1 with coordinates r_1 and Y_1, which characterizes the ***equilibrium in the market of goods***.

Similarly, the point E_2 is obtained, which characterizes the equilibrium in the market of goods, but with the values of income and interest rates – Y_2 and r_2, respectively.

Thus, it is possible to obtain an infinite set of points with equilibrium values of income and interest rate. However, two are sufficient for the study, by connecting which, the simplest *IS* line is obtained (fig. 4.1).

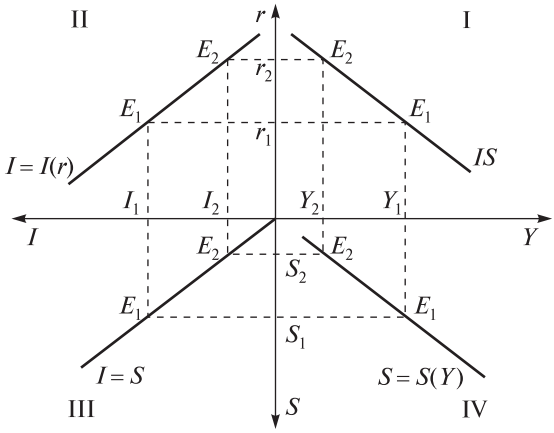

Fig. 4.1. Plotting *IS*

Any point on the *IS* curve shows the combinations of the interest rate and the volume of GDP that provide equilibrium in the goods market. This means that all the goods produced will be realized at this level of the interest rate, because the savings that households make will turn into investments and will allow them to realize all the capital assets produced in the economy. From the Keynes' point of view, the factor determining the amount of savings is the active role of investment, since the corresponding amount of investment creates a gross income, at which household incomes and consumption expenditures will be such as to provide the amount of savings necessary for a given amount of investment.

The *IS* curve has the following *properties*.

1. Has a negative slope.

2. The angle of inclination of the *IS* curve is determined by two factors: the multiplier of autonomous expenses and the sensitivity of investments to the interest rate *d*. Increasing the multiplier value makes *IS* flatter. It should be emphasized that the result takes place only for small changes in the magnitude of the multiplier. With a larger multiplier value, the same change in the interest rate and, consequently, investment leads to a greater increase in output (due to large indirect effects). Thus, a flatter *IS* is obtained.

If investments become more sensitive to the interest rate, then investment and aggregate demand change more with the same change in the interest rate

and the change in output will be greater. Thus, the *IS* curve corresponding to a higher investment sensitivity will be flatter.

The steep *IS* means that even with a significant reduction in the interest rate, investment and net exports will increase slightly, and therefore the overall increase in output will be small.

3. The growth of autonomous expenses leads to a shift of the *IS* curve to the right, and for each interest rate, the volume of production changes in proportion to the multiplier value.

4. If the *IS* curve shows equilibrium points in the goods market, then any point lying to the right of *IS* is characterized by an oversupply of goods, and any point lying to the left (or below) of the *IS* curve shows excessive demand for goods.

4.2. THE INTERACTION OF MARKETS FOR GOODS AND SERVICES AND MONEY WHEN CHANGING EXOGENOUS FACTORS. ANALYSIS OF ECONOMIC POLICY IN THE FRAMEWORK OF THE *IS–LM* MODEL. CONSEQUENCES OF THE *IS* LINE SHIFT. CONSEQUENCES OF THE *LM* LINE SHIFT

Having considered the commodity market and formulated the "investment – savings" equation, Hicks proceeds to analyze the money market. The Keynesian model of the money market used as the basis for the functioning of the market, i.e. the demand for money for transactions and speculative demand for money are considered. This allowed us to present the demand for money in the form of a liquidity equation

$$MD = eY - fr,$$

where e is a coefficient showing the sensitivity of the demand for money depending on the volume of GDP, i.e. the demand for money for transactions; f is a coefficient showing the sensitivity of the demand for money from the interest rate and characterizing the speculative motive. The money supply based on the Cambridge school equation, is fixed and is characterized by real cash balances, i.e. the amount of goods that can be purchased with money in the economic system

$$MS = \frac{M}{P}.$$

Taking into account the fact that in the money market in conditions of equilibrium, the demand for them is equal to the supply, it is possible to

determine the relationship between the equilibrium volume of GDP and the interest rate:

$$\frac{M}{P} = e \cdot Y - f \cdot r,$$

$$Y = \frac{M}{P} \cdot \frac{1}{e} + \frac{f}{e} \cdot r.$$

In canonical form, the *LM* equation will take the for:

$$r = -\frac{M}{P} \cdot \frac{1}{f} + \frac{e}{f} \cdot Y.$$

Using the graph (fig. 4.2), it is possible to analyze the interaction between the aggregate demand for money *MD* and the aggregate supply of money *MS* and, based on this, obtain the *LM* curve. Since it was assumed that prices are constant and their level is equal to one, the constant value of *M* corresponds to the real supply of money.

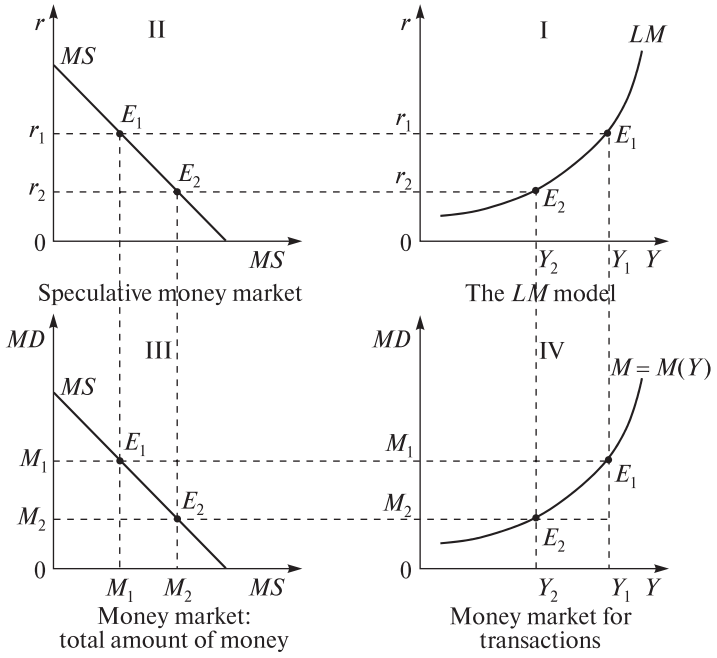

Fig. 4.2. The *LM* model

The money supply is indicated in the quadrant III. If all the money is intended for transactional purposes, then the *MS* money supply is located on the ordinate axis in the quadrant III. On the contrary, if all the money is intended for speculative purposes, then the money supply *MS* is located on the abscissa axis. The line connecting these points on the abscissa axis and the ordinate axis represents all possible combinations between the amount of money sent for transactions and the amount of money sent for speculative purposes. The growth of the money supply shifts the line to the right, and the decrease to the left. With the volume of transactional demand corresponding to point E_1, there should also be a certain amount of money left for speculative purposes. But the speculative supply of money is determined by the function of speculative demand for money in the c quadrant and is equal to M_1 at the interest rate r_1. In the quadrant I, this interest rate will correspond to the income level Y_1. Thus, the point E_1 of the *LM* line in the d quadrant is obtained. A lower level of income (for example, it gives an E_2 point on the *LM* line) will reduce the transactional demand for money and with this offer will be able to satisfy the increased speculative demand.

The LM curve characterizes the combination of the interest rate and the equilibrium volume of GDP, at which there is an equilibrium in the money market. It follows from the *LM* equation that the interest rate and the equilibrium volume of GDP change in the same direction, because the larger the volume of production, the higher the income and demand for money to pay for transactions with goods. In conditions of a fixed supply of money, the growth of demand for money inevitably causes an increase in the interest rate.

The *LM* curve has the following properties.

1. Has a positive slope.

2. The slope of the *LM* curve is determined by two factors: the sensitivity of the demand for money to changes in income (transaction motive) and the sensitivity to changes in the interest rate (speculative motive).

If the sensitivity of the demand for money to income *e* is higher, then the same increase in income entails a greater change in the demand for money. As a result, in order to restore equilibrium, it is necessary to reduce the attractiveness of money more, i.e. to raise the interest rate more. Thus, the greater the sensitivity of demand to income, the steeper the *LM* curve will be.

With a greater sensitivity of demand to the interest rate *f*, a smaller increase in the interest rate is required to return the market to equilibrium. Thus the greater the sensitivity of the demand for money to the interest rate, the more flat the *LM* curve will be. This means that the equilibrium in the money market is achieved with a very small reduction in the interest rate in response to the growth of the money supply.

3. A change in the real supply of money, the demand for money and a change in the price level leads to a shift in the *LM* curve. Consider the growth of the nominal money supply at a given price level. With the previous income *Y* and the interest rate, there will be an oversupply in the money market. In order to rebalance the market, it is necessary to increase the demand for money. This will happen if the interest rate drops for each income level, and as a result, the *LM* curve moves downn.

4. The *LM* curve characterizes the combination of the interest rate and the equilibrium volume of GDP, at which there is an equilibrium in the money market. Therefore, at the bottom (right) of the *LM* curve there is an excess demand in the money market, and at the top (left) of the *LM* curve there is an excess supply of money.

Consider the conditions under which the markets of goods and money are simultaneously in a state of equilibrium. As is well known, the IS curve reflects possible sets of combinations of the interest rate and the volume of production, at which there is an equilibrium in the market of goods and the planned costs are equal to the volume of GDP produced. The *LM* equation shows possible combinations of the interest rate and the volume of production, in which the amount of money that subjects wish to keep in their asset portfolio coincides with the amount of money, offered by the banking system, i.e. there is an equilibrium in the money market. Since the dependence of the GDP volume on the interest rate in the *IS* equation is inverse, and in the *LM* equation is direct, there is a single combination of the interest rate and output volume that simultaneously ensures equilibrium in both markets. This situation is achieved at a certain interest rate and the volume of GDP (the intersection point of the *LM* and *IS* curves (fig. 4.3). At the same time, the equilibrium can be established, according to representatives of neoclassical theory, automatically, and from the point of view of representatives of Keynesianism – with the help of state influence.

Let's consider the mechanism of automatic equilibrium formation according to the neoclassical theory. Any point on the *IS* curve located above point *E* (for example, point *A*) means that the economy will be in a state of equilibrium in the goods market, and in the money market the supply of money will exceed the demand for money (fig. 4.4). Money excess in the market will lead to a drop in the interest rate, and some households will try to sell their bonds and increase the demand for money. Thus, there will be a redistribution of money sent for transactions and for speculative purposes. A reduction in the interest rate on the money market will allow more investment in investments, will stimulate further GDP growth. An increase in output leads to an increase in income and demand for money for transactions, which causes an increase

in the interest rate on the money market and the redistribution of money between the payment of goods and savings. The process of redistribution will continue until there is an equilibrium in the money market, which will lead to stabilization of the volume of investments and equilibrium in the economy and will be characterized by a large volume of production at a lower interest rate (point *E* in fig. 4.3).

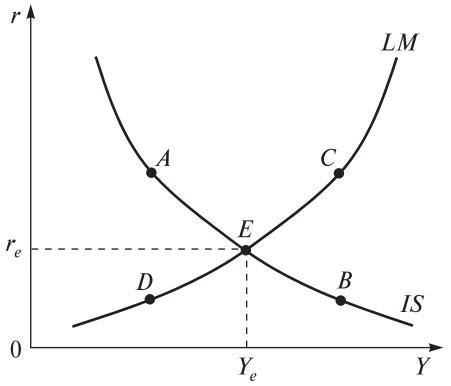

Fig. 4.3. The equilibrium of the economy in the *IS–LM* model

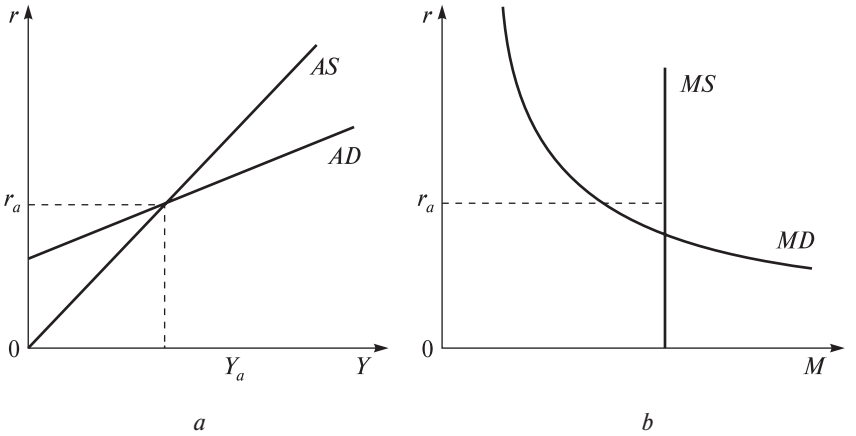

Fig. 4.4. The state of the economy at point *A*: *a* – goods market; *b* – money market

Any point on the curve *IS* located below the equilibrium point *E* (for example, point *B*) means that there will be an equilibrium in the goods market between the planned expenditures of subjects and the GDP produced. In the money market, the interest rate will be too low, which will lead to an excess of demand for money over supply. This will cause a redistribution of money, sent for transactions and for speculation, an increase in the interest rate to such a level that there will be an equilibrium in the money market. A higher interest rate in the money market will make investments less attractive, therefore, the equilibrium volume of GDP in the goods market will decrease (moving along the *IS* curve) and equilibrium will arise in both markets with less output and a higher interest rate.

Any point on the *LM* curve, located above point E means that equilibrium will be established in the money market (fig. 4.5, *b*). On the goods market, a high interest rate will lead to an increase in unplanned inventories as a result of the fact that it will be more profitable for business entities not to purchase goods and services and not invest in production, but to save part of their income in commercial bank accounts, and, accordingly, part of the products produced will not be sold. This creates a deflationary gap in the real sector of the economy (fig. 4.5, *a*). In this situation, entrepreneurs will begin to reduce production, which will lead to a drop in investment and output. The incomes of business entities will fall and, as a result, the demand for money for transactions, and, in turn, the interest rate will decrease. The redistribution of the money supply will allow a new equilibrium to be formed in the money market at a lower interest rate and an equilibrium in the goods market.

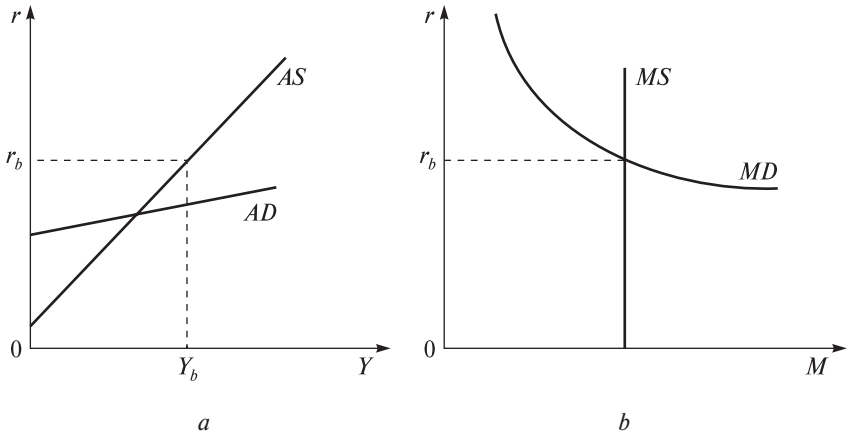

Fig. 4.5. The situation in the economy at point *B*:
a – goods market; *b* – money market

Any point on the *LM* curve below point *E* means, that there is an equilibrium in the money market, and in the commodity market this interest rate is very low to ensure equilibrium. Production cannot meet the entire aggregate demand, which creates an inflationary gap in the economy. The increase in production is possible due to the growth of investments, at the expense of own and borrowed funds. The demand for borrowed funds stimulates an increase in the interest rate. An increase in production volume causes an increase in the income of employees who need cash to pay for goods and services. Consequently, the demand for money for transactions will increase, which will lead to a redistribution of money directed to transactions and speculation. The process of redistribution will continue until a new, higher equilibrium interest rate is formed in the money market, which will stop the growth of investments. Same time, there will be an equilibrium in the market of money and goods.

The *IS–LM* model, from the point of view of representatives of Keynesianism, allows us to analyze the consequences of the influence of external factors on the equilibrium state. The change in the equilibrium conditions in the model occurs as a result of changes in aggregate demand, demand for money and money supply. These factors are reflected by the shift of the *IS* or *LM* curve on the graph.

Consider the ***shift of the IS curve***. It occurs under the influence of change:

– consumer spending;
– investment expenses;
– government spending;
– net autonomous taxes;
– tax rates.

In fact, this means that the government can influence the equilibrium state of the economy (the *IS* curve shifts) through fiscal policy, changing government spending and taxes. Under the influence of increased consumption, investment, government spending and cuts in autonomous taxes and/or a reduction in the tax rate, aggregate demand is growing (the IS curve shifts upwards to the right). It exceeds the total supply and stimulates the growth of production, which can be achieved through additional investments. An increase in the volume of investments will cause an increase in the demand for money for transactions, which, in turn, will increase the overall demand for money, and the interest rate on the money market will grow. An increase in the interest rate leads, on the one hand, to a redistribution of the demand for money for transactions and speculative demand and the formation of equilibrium in the money market at a higher equilibrium interest rate, and on the other hand, to the cessation of investment growth and the formation of equilibrium in the goods market, characterized by a large volume of production. The new equilibrium in fig. 4.6 is described by the point E_2.

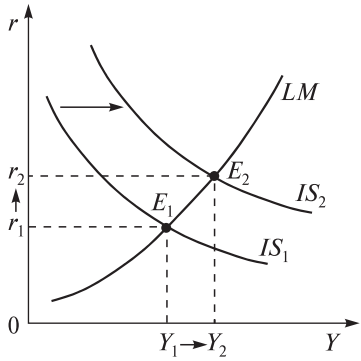

Fig. 4.6. The effect of the shift of the *IS* curve on the equilibrium in the *IS–LM* model

Aggregate demand falls under the influence of a reduction in consumer spending, investment, government spending and an increase in taxes or the tax rate (the *IS* curve shifts to the left), leading to a decrease in the equilibrium interest rate and output. A drop in aggregate demand causes an increase in unplanned stocks among manufacturers (they will decide to get rid of growing stocks of finished products and reduce production). In the economy, the demand for money for transactions and the general demand for money will decrease, too much money will appear, i.e. the demand for money will be less than the supply of money. As a result, the interest rate on the money market decreases, which leads to the redistribution of money directed to transactions and speculation (it becomes less profitable to keep savings in the form of securities). The reduction of the interest rate continues until the equilibrium in the money market is formed, at the same time there will be interest in investments and further decline in output will stop. A balance will also be established in the goods market.

Consider the shift of the *LM* curve. It can occur under the influence of changes in:

– demand for money;

– money offers;

– the price level (in this case, the volume of real cash balances and the real money supply change).

If, under the influence of external factors, there is an increase in the demand for money, then the interest rate will increase (fig. 4.7, *b* (the *LM* curve shifts up to the left)), because the demand for money will exceed their supply (fig. 4.7, *a*).

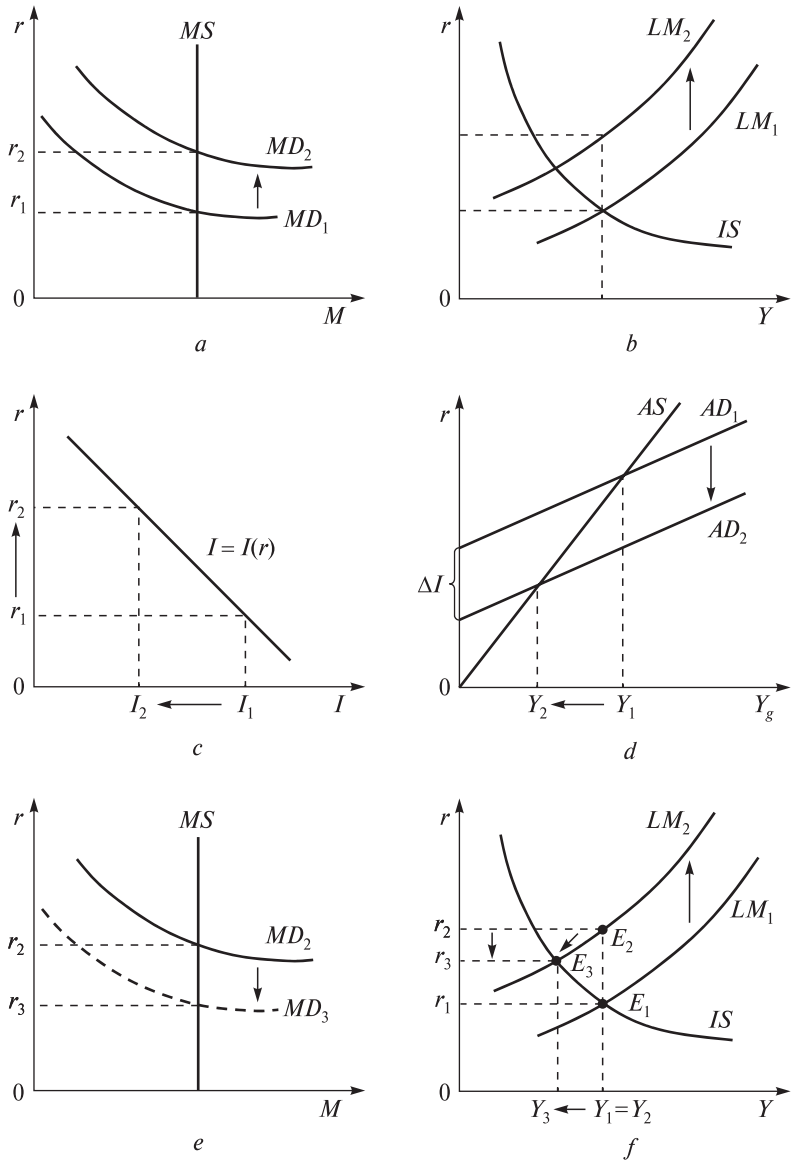

Fig. 4.7. Interrelation of the processes of equilibrium formation under the influence of the growth of demand for money

As a result, the demand for money for speculation is increasing in the money market, since it becomes more profitable to keep savings in the form of securities due to an increase in the interest rate. The volume of investments in the goods market is falling due to the high interest rate, which will reduce aggregate demand (fig. 4.7, *c*). The aggregate supply is becoming larger than the aggregate demand for goods and services, and unplanned stocks of products are growing. An increase in stocks will force entrepreneurs to reduce production and aggregate supply (fig. 4.7, *d*). A reduction in output will cause a decrease in income and demand for money for transactions, which will lead to a drop in total demand for money and a redistribution of the amount of money sent for transactions and for speculation – an equilibrium will be established in the money market (fig. 4.7, *e*). At the same time, the decline in production will stop in the goods market and a new equilibrium will be formed. The overall result of changes in the economy under the influence of an increase in demand for money will be an increase in the equilibrium interest rate with a smaller volume of GDP (fig. 4.7, *e*, point E_3).

The reduction in demand for money occurs under the influence of external factors (the *LM* curve shifts to the right), while the interest rate falls, causing a decrease in demand for money and an increase in investment. Aggregate demand exceeds aggregate supply, firms' product stocks are shrinking – entrepreneurs decide to increase production. The growth of aggregate demand for goods and services leads to an increase in demand for money for transactions, which slows down the fall in the interest rate on the money market and causes the redistribution of money sent for transactions and speculation until an equilibrium is formed in the money market. Fixing the interest rate on the money market at an equilibrium level will help to stop the growth of investment, aggregate demand will become equal to the volume of production, i.e. aggregate supply. Thus, an equilibrium will be established in the market of goods. As a result, a new equilibrium will be formed, characterized by a large volume of GDP at a lower level of the interest rate (point E_2 in fig. 4.8).

The increase in money supply due to the policy of "cheap" money causes a change in the money market (*LM* shift to the right); the new equilibrium is characterized by a large volume of production at a lower interest rate in the money market.

A reduction in the supply of money as a result of the policy of "expensive" money (*LM* shifts to the left upwards) leads to an increase in the equilibrium interest rate on the money market and a decrease in the volume of production of goods and services, i.e., the fight against inflation through the policy of "expensive" money contributes to a recession in the economy and unemployment.

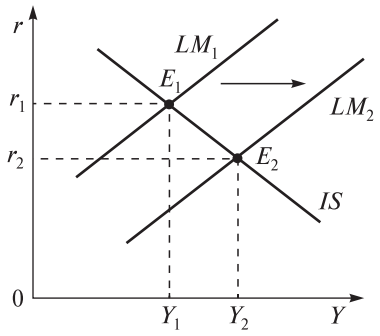

Fig. 4.8. The formation of equilibrium under the influence of the shift of the *LM* curve

The actual supply of money (cash balances) depends on changes in the price level. If ***prices fall*** in the national economy, then with a constant mass of money, the real cash balances and the supply of money increase (the *LM* curve shifts down to the right). As a consequence, the new equilibrium is characterized by a large volume of production at a lower interest rate (the *LM* curve shifts down to the right). In fact, lowering the price level is equivalent to the policy of "cheap" money, it is used by representatives of Keynesianism to accelerate economic growth.

If prices rise, then with a constant mass of money in the economy, the real cash balances and the real supply of money decrease (the *LM* curve shifts to the left). The new equilibrium is characterized by a smaller volume of production at a higher interest rate, i.e. a decrease in real cash balances is equivalent to a policy of "expensive" money.

It is assumed that aggregate demand changes under the influence of the fiscal policy of the government, which changes the size of public procurement or taxes. As part of a stimulating policy, it increases public procurement *G* or reduces taxes, and as part of a restraining discretionary policy, it reduces public procurement and/or increases taxes to reduce inflation. The money market is influenced by the policy of the National Bank. It changes the *MS* money supply. If the goal is to fight inflation, then the National Bank pursues a policy of "expensive" money (reduces the supply of money), and if the goal is to fight unemployment and ensure economic growth, then it pursues a policy of "cheap" money (increases the supply of money).

The analysis shows that the government stimulates economic growth and reduces unemployment if it complements the stimulating fiscal policy with the

policy of "cheap" money. The fight against inflation involves a combination of a restraining fiscal policy with a policy of "expensive" money. Any other combinations give less effect on the goal.

The *IS–LM* model makes it possible to study the process of interaction of commodity and money markets as a result of the use of fiscal and monetary policy as instruments of macroeconomic regulation. The instruments of fiscal policy are directly aimed at the goods market. Such tools are changes in the volume of public procurement and the level of taxes. Monetary policy instruments are aimed at the money market. It is carried out by the National Bank by changing the money supply in the country. Let's assume that the government pursues a stimulating fiscal policy by increasing public procurement or reducing taxes (fig. 4.9).

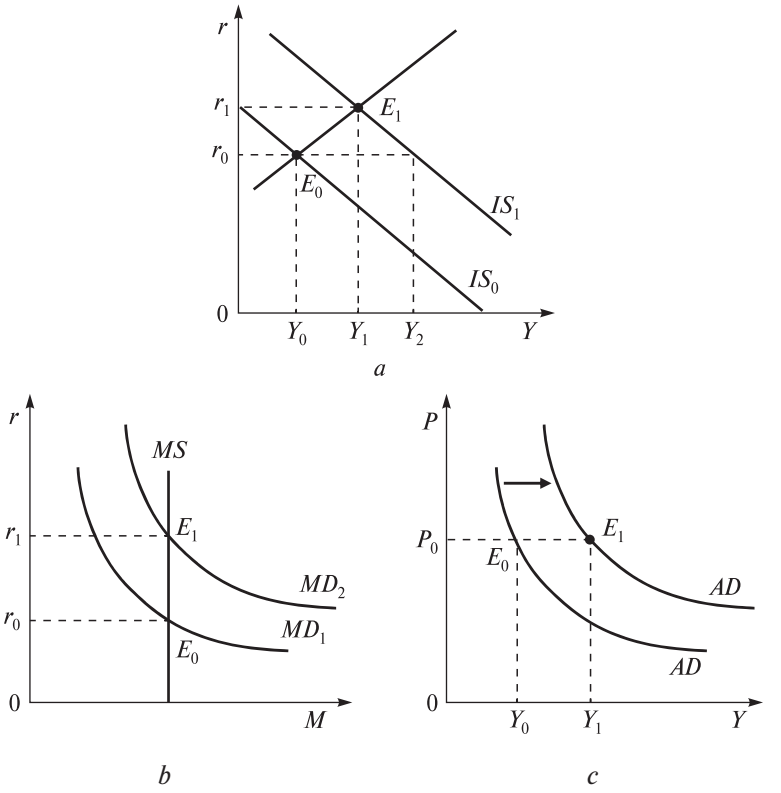

Fig. 4.9. Effect of stimulating fiscal policy:
a – *IS–LM* model; *b* – money market; *c* – aggregate demand curve

In this case, the *IS* curve shifts to the right to the IS_1 level, i.e. the volume of production will increase by an amount equal to the product of additional investments by a multiplier. With the interest rate unchanged, the volume of production would grow to the level of Y_2 (fig. 4.9, *a*). But this is impossible, because at the same time the equilibrium in the money market is disturbed: the demand for money exceeds the supply and there is a shortage of money. Due to lack of money, some entities will start selling bonds, which will cause a decrease in their market price and an increase in the interest rate to the level of r_1 (fig. 4.9, *b*). A higher interest rate will limit investment demand from firms. As a result, the aggregate demand in the goods market will grow not to the Y_2 level, but to the Y_1 level. Thus, the money market reduces the multiplier effect of government spending growth (displacement effect).

One of the consequences of the increase in government spending is an increase in the interest rate, which leads to a reduction in investment, household consumption (because credit becomes more expensive). The displacement effect is only partially manifested. Overall, aggregate demand is increasing. Consequently, with prices unchanged as a result of fiscal policy, aggregate demand will be higher, and that is why any increase in government spending causes a shift in the aggregate demand curve to the right.

It should be noted that the ***displacement effect is relatively insignificant*** in two cases.

1. Investments and net exports are not elastic to an increase in the interest rate on the money market. In this case, even a significant increase in the interest rate will cause a slight displacement of investment and net exports, and therefore the overall increase in output will be significant. This situation is illustrated by the steeper *IS* curve. The slope of the *LM* curve is of secondary importance (fig. 4.10, *a*).

2. The demand for money is highly elastic to an increase in the interest rate, and a slight increase in the interest rate is enough to balance the money market. This situation is illustrated by a flatter LM curve. The slope of the IS curve is of secondary importance (fig. 4.10, *b*). Stimulating fiscal policy is most effective when a relatively steep *IS* curve and a relatively flat *LM* curve are combined.

Stimulating fiscal policy is relatively ineffective if the effect of displacement exceeds the effect of output growth. ***The displacement effect is significant if***:

1) investments and net exports are highly elastic to the dynamics of the interest rate. In this case, a slight increase in the interest rate will cause a significant reduction in investment, net exports and output;

2) the demand for money is inelastic to a change in the interest rate. In this case, in order to form an equilibrium in the money market, a significant

increase in the interest rate is required. The *LM* curve is steep, and the slope of the *IS* curve is of secondary importance.

It should be noted that the ***final effect of fiscal policy*** depends on the state of the economy, which is determined by the ***shape of the aggregate supply curve***.

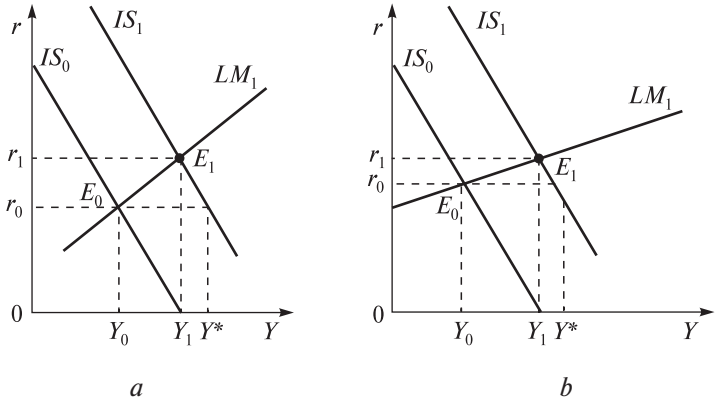

Fig. 4.10. Situations of insignificant displacement effect:
a – inelasticity of the *IS* curve; *b* – elasticity of the *LM* curve

In a *situation of underemployment* (the "Keynesian" segment of *AS*), the result of fiscal policy will only be an increase in output at a constant price level, i.e. the effectiveness of public policy is sufficiently high and the government achieves its goals. This is explained by the fact that the initial equilibrium in the commodity market and the money market was formed with a volume of production significantly smaller than the volume of production corresponding to full employment and a low interest rate. In such a situation, there is a low demand for money for transactions and a high speculative demand for money. If the volume of production increases in this state, then the additional need for money for transactions is met at the expense of money intended for speculation, without causing a significant increase in the interest rate.

In a *situation close to full employment* (the upward segment of the *AS* curve), an increase in government spending contributes to an increase in output and an increase in prices. This is due to the fact that the growth of household incomes causes an increase in demand for money for transactions, increasing the shortage of money in the economy. The growing demand for money with a fixed supply will force households and firms to sell bonds more actively, which will reduce their value and increase the interest rate. A higher interest rate, in turn, will restrain the investment process and consumer spending. As a result,

the growth of employment and production will become "more expensive" than at the previous interest rate, which will lead to an increase in the price level in the goods market.

In the classical case, when *full employment is in the economy* (the *AS* curve is vertical), the growth of aggregate demand as a result of the stimulating fiscal policy of the state will not change the volume of production, but will only cause an increase in prices in the country, i.e. the state policy will not achieve the goal and will result in demand inflation.

The essence of monetary policy is the impact of the state on the economy by changing the amount of money in circulation. The main role in conducting monetary policy belongs to the National Bank, which can change the discount rate and the rate of mandatory reserves, conduct transactions with securities.

Let's assume that the economy is in a state of equilibrium in both the goods market and the money market (fig. 4.11, point E_0).

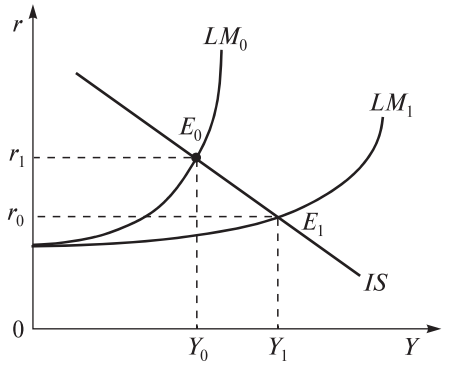

Fig. 4.11. The change in equilibrium with an increase in the supply of money

To solve the employment problem, the National Bank pursues a policy of "cheap" money and buys government bonds. This causes the *LM* curve to shift to the right. The policy of the National Bank does not directly affect the real sector, and therefore the *IS* curve does not change its position. An increase in the amount of money will help reduce the interest rate to r_1. In the goods market, economic entities will respond with an increase in investment demand, which will lead to an increase in employment and a multiplicative expansion of the volume of production Y_1. An increase in production and income will cause an increase in demand for money to pay for transactions and, as a result, interest rates on the money market. The goods market will react to this by

reducing the volume of investment, employment and production. Thus, the interaction of markets means that the initial momentum in the money market moves to the goods market. The processes taking place in this market cause an increase in the interest rate and the attenuation of investment and production activities in the goods market. The fading effect of the monetary impulse will continue until a new equilibrium in the economy is established. After that, the state will again take measures to increase the supply of money to reduce the interest rate and boost investment, employment, and output. An active monetary policy is one of the main theoretical provisions of the Keynesian model of economic development underlying monetary policy. However, this mechanism works only if the intersection point of the curves *IS* and *LM* falls on the ascending segment of the curve *LM*.

If the equilibrium in the economy is established at a minimum interest rate, then the increase in the amount of money will not affect the volume of investment, employment and production. As a result of the liquid trap, M. Friedman considers the liquid trap to be an inevitable consequence of the growth of the money supply in the Keynesian theory of money. In a situation of a liquid trap, the money demand curve is horizontal – the interest rate cannot decrease and investments will not grow. The owners of securities will try to move all their wealth into money, as a result of which the speculative demand for money will increase dramatically. The economy will not be able to get out of the state of crisis, i.e. the connection between the money market and the goods market is broken and the commodity market does not react to the increase in the amount of money, because it cannot affect the interest rate (fig. 4.12) It follows that in a *situation of a liquid trap*, monetary policy as a tool to stimulate aggregate demand will not bring the desired result. Therefore, according to representatives of Keynesianism, there is only one tool left – fiscal policy, which directly affects aggregate demand through changes in taxes and government spending.

If the economy is in a situation described by the intersection of the *IS* curve and the vertical segment of the *LM* curve, then an increase in the supply of money leads to an increase in output with a decrease in the interest rate, but to a somewhat lesser extent than with an upward segment (fig. 4.13). In this case, the effectiveness of monetary policy will be the highest, since an increase in the supply of money causes a significant reduction in the interest rate and an increase in output (point E_1 in fig. 4.13). Representatives of monetarism emphasize the importance of increasing the nominal supply of money to stimulate aggregate demand and output growth and believe that changes in fiscal policy do not affect aggregate demand and output.

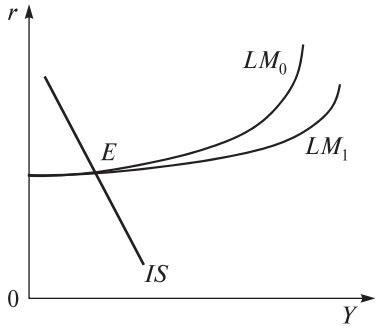

Fig. 4.12. Monetary policy in a liquidity trap

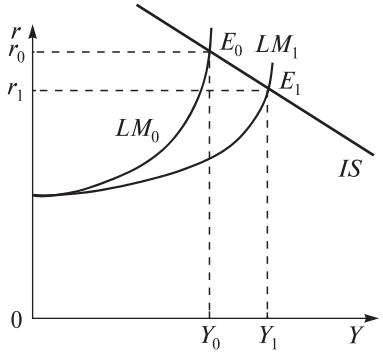

Fig. 4.13. Intersection of the *LM* curve on a vertical segment

However, a different result will be obtained in the case of an ***investment trap***, which develops in a situation of completely inelastic demand for investments relative to the interest rate. It occurs if investors are pessimistic about the prospects for economic development. In this case, the *IS* curve is vertical, i.e. the shift of the *LM* curve in any part of it will not change the value of the real volume of production. Consequently, monetary policy will have no effect on aggregate demand and only fiscal policy will be effective.

Thus, as a result of the analysis of the *IS–LM* model, it is clear that monetary policy is effective only at a high interest rates. In this case, the growth of the money supply will lead to a decrease in the interest rate, which means an increase in investment and production. Fiscal policy is most effective in the situation of the horizontal *LM* curve and the vertical *IS* curve. In the presence of a liquid trap, fiscal policy does not change the interest rate, because the equilibrium in the money market is achieved with its single value. If the *LM* curve is ascending, then the stimulating fiscal policy leads to an increase in the interest rate, which reduces the costs of economic entities (the displacement effect).

4.3. *IS–LM* AS A THEORY OF AGGREGATE DEMAND. GRAPHICAL CONSTRUCTION OF THE AGGREGATE DEMAND FUNCTION. ALGEBRAIC REPRESENTATION OF THE AGGREGATE DEMAND LINE

The *IS–LM* model is used to explain the short-term change in the volume of GDP at a fixed price level. At the same time, it is possible to analyze the relationship of the *IS–LM* model with the *AD–AS* model by looking at the

changes in the *IS–LM* model when the price level fluctuates. In fact, the *IS–LM* model is a model of aggregate demand.

To obtain the *AD* curve, you can use the *IS–LM* model. In order to explain the negative slope of the *AD* curve, it is necessary to look at what will happen to the *IS–LM* model when the price level changes. It is known that a decrease in the price level increases the real cash balances, i.e. the supply of money increases, and the *LM* curve shifts downward, causing a decrease in the interest rate. In the goods market, a reduction in the interest rate will lead to an increase in investment and production. On the aggregate demand curve, this is reflected by moving from point E_1 to point E_2, which indicates a negative slope of the curve (fig. 4.14).

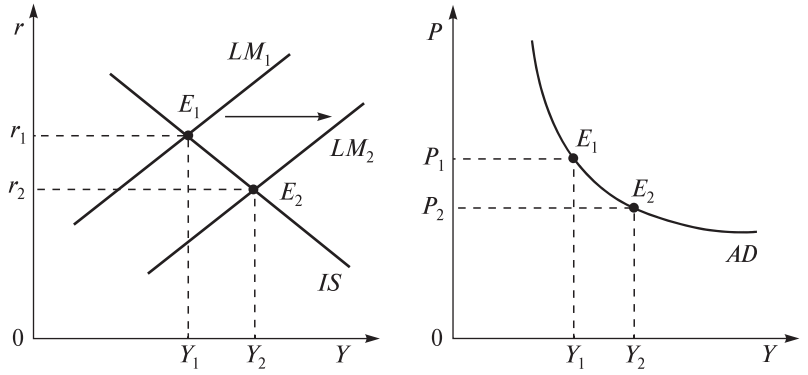

Fig. 4.14. Output of the aggregate demand curve from the *IS–LM* model

Using *IS–LM*, it is possible to investigate the causes of the shift of the *AD* curve. It can be argued that the factors that shift the *IS* and *LM* curves also cause shifts in the *AD* curve. Stimulating monetary or fiscal policy measures increase output in the *IS–LM* model, and, consequently, the *AD* curve shifts to the right (fig. 4.15). For example, tax cuts cause an increase in household incomes, which, at constant prices, can increase demand for goods.

Restraining monetary or fiscal policy measures reduce output in the *IS–LM* model, and the *AD* curve shifts to the left.

Thus, the change in the level of production in the *IS–LM* model, resulting from a change in the price level, is a movement along the *AD* curve. The change in the volume of production in the *IS–LM* model at a fixed price level represents a shift of the entire *AD* curve.

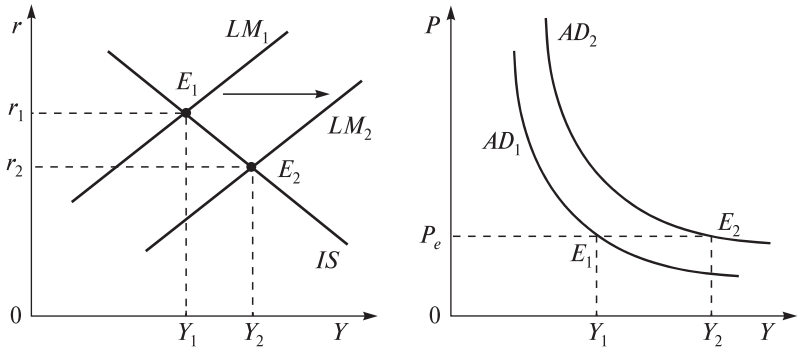

Fig. 4.15. The effect of the shift of the *LM* curve at constant prices on the aggregate demand curve

The *AD* curve from the *IS–LM* model is derived mathematically. It is known that the curve *IS* has the form

$$Y = \frac{C_a + I_a}{1 - MPC} + \frac{-MPC}{1 - MPC}T + \frac{1}{1 - MPC}G - \frac{d}{1 - MPC}r.$$

The *LM* curve has the form

$$r = \left(-\frac{M}{P}\right)\left(\frac{1}{f}\right) + \left(\frac{e}{f}\right)Y.$$

To obtain the equations of the curve *AD*, it is necessary to find the volume of production that satisfies both the equation *IS* and the equation *LM*. The interest rate from the *LM* equation is substituted into the equation of the *IS* curve

$$Y = \frac{C_a + I_a}{1 - MPC} + \frac{-MPC}{1 - MPC}T + \frac{1}{1 - MPC}G - \frac{d}{1 - MPC}\left[\left(\frac{e}{f}\right)Y - \left(\frac{1}{f}\right)\left(\frac{M}{P}\right)\right]r.$$

After the transformations, you can get a solution to this equation with respect to *Y*

$$Y = \frac{C_a + I_a}{1 - MPC} + \frac{-MPC}{1 - MPC}T + \frac{1}{1 - MPC}G -$$
$$-\frac{d}{1 - MPC}\left(\frac{e}{f}\right)Y - \left[\frac{d}{1 - MPC}\right]\left[\left(\frac{1}{f}\right)\left(-\frac{M}{P}\right)\right];$$

$$Y + \left[\frac{d}{1-MPC}\right]\left(\frac{e}{f}\right)Y = \frac{C_a + I_a}{1-MPC} + \frac{-MPC}{1-MPC}T +$$
$$+\frac{1}{1-MPC}G - \left[\frac{d}{1-MPC}\right]\left[\left(\frac{1}{f}\right)\left(-\frac{M}{P}\right)\right].$$

If we further transform the equation, and the expression $f / [f + de / (1 - MPC)]$ denote by z, then we get the equation of aggregate demand:

$$Y = z\frac{C_a + I_a}{1-MPC} + z\frac{-MPC}{1-MPC}T + z\frac{1}{1-MPC}G - \frac{d}{(1-MPC)z}\left(\frac{M}{P}\right).$$

It follows from this equation that the volume of production depends on the variables characterizing fiscal (taxes and public procurement) and monetary policy (money supply), and on the price level. The *AD* curve graphically depicts the solutions of this equation, representing all possible combinations of the value of the production level and the price level at fixed values of *G*, *T* and *M*.

Based on the obtained equation, it is possible to formulate the *properties of the curve AD*:

– has a negative slope, because the increase in the price level reduces the real cash balances and, consequently, the volume of income and aggregate demand;

– an increase in the supply of money increases income, and the *AD* curve shifts to the right;

– an increase in government spending or tax cuts increases income, and the *AD* curve shifts to the right;

– since *z* is less than 1, the multiplier in the *IS–LM* model has a smaller value than in the Hicks – Samuelson cross model. Therefore, the parameter *z* characterizes the effect of the displacement effect;

– the equation of the *AD* curve shows the relationship between the *AD* curve derived from the *IS–LM* model and the *AD* curve derived from the equation of the quantitative theory of money. The quantitative theory of money assumes that the interest rate does not affect the volume of demand for money, i.e. the parameter *f* is zero. It follows that the parameter *z* will also be zero and fiscal policy is not able to influence aggregate demand.

The *IS–LM* model explains the functioning of the economy in the short term, when the price level is fixed. However, this model can also be used to describe the economy in the long term, when the price level changes, ensuring that the volume of output corresponds to the potential volume of production in the economy. Using the *IS–LM* model to describe the long-term period, it is

possible to show the differences between the Keynesian model of the national economy and the classical one.

The main difference lies in the Keynesian premise of a fixed price level. Depending on the variables of fiscal and monetary policy, and other factors determining *AD*, the volume of production may deviate from the natural level at a constant price level. The classical approach consists in the provision of a flexible price level: the price level is adjusted in order to ensure that the actual volume of production corresponds to the potential volume of production in the economy.

It is possible to describe the national economy as a system with three equations. These are the equations *IS*, *LM*, which contain three variables: the volume of production *Y*, the price level *P* and the interest rate level *r*. The third equation will have different forms depending on the approach to analysis. The Keynesian approach consists in the premise of fixed prices. Therefore, the third equation is

$$P = P_1.$$

This means that the interest rate and the volume of production should change in such a way as to ensure the simultaneous solution of the *IS* and *LM* equations at constant prices. According to the classical theory, the actual volume of production reaches a potential level, and therefore the third equation will be

$$Y = Y_1.$$

This assumption means that in order to satisfy the *IS* and *LM* equations, the interest rate and price levels must change. It is believed that the classical theory is the most acceptable for the analysis of the long-term period. Therefore, the effectiveness of the state's incentive policy in the long term should be considered based on the classical approach regarding changes in the price level.

The *IS–LM* model is considered a tool for analyzing the results of stimulating fiscal and monetary policy in a closed economy, since:

– allows you to compare the impact of fiscal and monetary policy on the change in output. Studying the slope of the *IS* and *LM* curves clarifies the essence of the dispute in macroeconomics about the two types of policies and allows you to list the reasons why they may be ineffective;

– taking into account the wealth factor in the model shows that government policy always affects the volume of production, even indirectly;

– analysis of ways to finance the budget deficit leads to a dynamic interpretation of the model. It can be argued that under some hypotheses, the economy cannot stabilize due to the inevitable growth of the state budget deficit;

– the introduction of *AD* and *AS* functions into the model allows you to determine both the price level and the volume of employment;

– according to the model, inflation begins as a result of an autonomous increase in aggregate demand or a rise in prices. Consequently, it may persist due to the alignment of supply and demand.

The *IS–LM* model has caused the need to consider the general equilibrium in order to understand the interaction of real and monetary phenomena. The creation of the model led to the further development of economic analysis in such areas as:

– taking into account the effect of wealth and price;

– the importance of macroeconomic relations in the study of microeconomic behavior;

– accounting in the analysis of the real and financial sectors in a broad sense. The *IS–LM* model is a tool for analyzing Keynesian theory. J. M. Keynes believed that in conditions of uncertainty, full employment is impossible. Underemployment in the condition of equilibrium, in his opinion, is a normal situation. Thus, he tried to reduce the neoclassical model to a special case of his general theory. The *IS–LM* model transforms the Keynes model into a special case of the neoclassical model. Full employment is the norm if one of the hypotheses is used:

– prices in the economy are fixed;

– nominal wages are inflexible to reduce if prices become flexible. These Keynes hypotheses can be applied within the framework of the neoclassical interpretation of *IS–LM* as special cases. Keynes does not consider optimizing rational activity to justify price stability or wage inflexibility. He does not believe that these two working hypotheses should form the basis of a general theory.

QUESTIONS

1. What are macroeconomic foundations for plotting the IS-LM model?
2. Plot the IS curve and explain its essence
3. What is the essence of the LM curve graph?
4. Why is the slope of the IS curve negative and the slope of the LM curve positive?
5. Explain the mechanism for forming equilibrium in the IS-LM model
6. If the goods market is in equilibrium, can the money market be in equilibrium?
7. What factors influence the shift of the IS and LM curves and how do they influence it?
8. What is the effectiveness of fiscal and monetary policy within the IS-LM model?

5. STABILIZATION POLICY IN A SMALL OPEN ECONOMY (MANDELL – FLEMING MODEL)

Basic concepts
The Mandell – Fleming model. Open economy. Floating exchange rate. Economic policy. Fixed exchange rate. Monetary policy. Trade policy.

5.1. EXTENSION OF THE *IS–LM* MODEL TO THE MANDELL – FLEMING MODEL. EXOGENOUS AND ENDOGENOUS VARIABLES IN MODEL EQUATIONS. GRAPHICAL INTERPRETATION OF THE MODEL

An important theoretical task is to determine the effectiveness factors of the central bank's policy aimed at stimulating an open economy through exchange rate regulation. This problem is solved by constructing and analyzing the Mundell – Fleming model. Consider the Mundell – Fleming model for an open economy. The conclusion about the degree of effectiveness of the policy depends on the time period. The short-term period is characterized by the condition of rigid prices at home and abroad (prices do not change, i.e. there is no inflation at home and abroad and the real exchange rate is the same as the nominal), and the long-term period is characterized by full flexibility prices in the domestic market and the stability of the price level abroad.

The Mundell – Fleming model is a modified *IS–LM* model for an open economy, considered at a constant price level and described by the equilibrium condition between commodity and money markets:

$$\begin{cases} IS:\ Y = C(Y-T) + I(r) + G + NX(RER), \\ LM:\ \dfrac{M}{P} = L(Y, r), \\ G = G_1. \end{cases}$$

In the linear version, *IS* and *LM* will take the following form

$$\begin{cases} IS:\ Y = (C_G - C_{\tilde{Y}}(1-t_Y)Y) + (I_a - I_i \cdot r) + \tilde{G} + (g - k \cdot RER), \\ LM:\ \dfrac{\tilde{M}}{P} = l_Y \cdot Y - l_i \cdot r, \\ G = \tilde{G},\ T = \tilde{T}. \end{cases}$$

In the foreign exchange market, net foreign investment (the difference between the amount invested in foreign assets by domestic investors) represents the supply of currency: $NFI = NFI(r)$, $\partial NFI / \partial r < 0$.

$$\begin{cases} IS: \ Y = C(Y - T) + I(r) + G + NFI(r), \\ LM: \ \dfrac{M}{P} = L(Y, r), \\ NFI(r) = NX(RER, Y). \end{cases}$$

Thus, short-term equilibrium in the conditions of price rigidity in the economy is achieved by simultaneous equilibrium in three markets: the market for goods and services, the money market and the foreign exchange market.

As a measure of the effectiveness of the central bank's exchange rate policy aimed at stimulating aggregate output, the value, $dY / dRER$, is used, which shows how many units the GDP will change when the national currency changes by one unit:

$$\frac{dY}{dRER} = \frac{\dfrac{\partial NX}{\partial RER}}{\dfrac{1 - \dfrac{\partial C}{\partial (Y - T)}}{\dfrac{\dfrac{\partial I}{\partial r} / \partial NFI}{\partial r} + 1} - \dfrac{\partial NX}{\partial Y}}.$$

Analyzing the formula, we can draw the following conclusion: the weakening of the national currency in the Mundell – Fleming model causes an increase in output. The effectiveness of an output-stimulating policy increases if the sensitivities of net exports to changes in the real exchange rate and investments to changes in the interest rate increase, and the sensitivities of net exports to changes in income and net foreign investment to changes in the interest rate decrease.

The result obtained is consistent with empirical estimates of the consequences of the 1998 devaluation, when, in the context of a high sensitivity of net exports to income, the depreciation of the national currency led to import substitution and a significant increase in total output.

We divide all variables in the Mundell – Fleming model into two groups (internal and external). External variables of the Mundell – Fleming model are: money supply (M), government spending (G), tax level (T), price level (P), and internal variables: income (Y), exchange rate (RER), interest rate (r). The task of the model is to analyze the influence of external variables on internal ones.

The Mundell – Fleming model considers a small open economy with perfect capital mobility, resulting in the equalization of the interest rate at home and abroad ($r = r^*$).

One of the main conclusions of the Mundell – Fleming model is that the nature of the functioning of the economy is completely determined by the exchange rate system adopted in a given country (fixed or floating rate).

The Mundell – Fleming model is considered in 2 versions. Each option analyzes the dependency between two internal variables, while the third variable is taken as const.

5.2. ECONOMIC POLICY IN A SMALL OPEN ECONOMY WITH A FLOATING EXCHANGE RATE

In an economy with a floating exchange rate, the state, for stabilization purposes, can apply a fiscal (fiscal), monetary (monetary), foreign trade policy, or their various combinations. In addition to the system of exchange rates, the effectiveness of the policy pursued will be influenced by the time period of consideration, namely the short or long term.

1 case. Consider the impact of fiscal policy.

Let's assume that the government is pursuing a stimulating fiscal policy, i.e. ↑G. In this case, the *IS* curve will shift to the right, i.e. *RER**↑, *Y* – const. This is due to the fact that this policy leads to increased pressure on the domestic interest rate. Capital flows from abroad into the country, the exchange rate rises, net exports fall.

Thus, an expansionary fiscal policy leads to an appreciation of the real exchange rate and a crowding out of net exports. Since the equilibrium value of income does not change when applying this policy, its short-term and long-term consequences are the same (fig. 5.1).

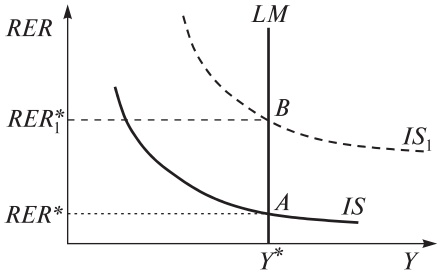

Fig. 5.1. Stimulating fiscal policy
in the coordinates "income–exchange rate"

This conclusion differs from the conclusion of the *IS–LM* model for a closed economy. If we considered a closed economy, then this policy would lead to an increase in income and interest rates, which are determined in terms of ignoring capital flows and international flows of goods. In an open economy, income does not increase because ↑G causes net exports to fall.

2 case. Consider the impact of monetary policy.

Let us assume that the government is pursuing an expansionary monetary policy, i.e. The Central Bank increases the money supply under the condition of constant prices (P – const, $M\uparrow \rightarrow (M/P)\uparrow$. As a result of the increase in the real stock of money, the equilibrium value of income increases. The *LM* curve shifts to the right (fig. 5.2).

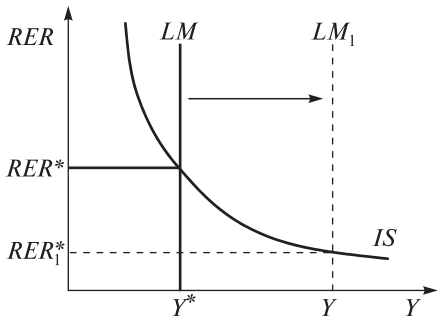

Fig. 5.2. Stimulating monetary policy
in the coordinates "income–exchange rate"

In a closed economy, an increase in the money supply leads to a decrease in the interest rate → an increase in investment demand.

In the case of an open economy, the domestic interest rate is fixed by the world interest rate, however, even a small downward impact on the interest rate leads to an outflow of capital from the country. Thus the demand for the national currency will decrease, so the equilibrium exchange rate will weaken, and income will increase → increase net exports and the equilibrium value of *GNP* will increase.

Thus, in the short run, an accommodative monetary policy leads to an increase in income.

If initially the economy was in a state of long-term equilibrium, then the new short-term equilibrium characterizes the state of the boom. In the long run, prices rise, the real money supply shrinks, and the supply curve shifts to the left until it returns to its original position. Since the price level has risen and the real exchange rate has not changed, therefore, the nominal exchange rate will fall by the same amount as the price level rises.

Thus, from the point of view of the long-term aspect, monetary policy does not affect real indicators, but only nominal ones.

3 case. Influence of foreign trade policy.

Suppose the government pursues a protectionist policy (for example, introduces import quotas). Import ↓→ Net export ↑, *IS* curve shifts to the right. In this case, since the demand for foreign currency has decreased relative to the demand for national currency, the exchange rate should rise (*RER* ↑) (fig. 5.3).

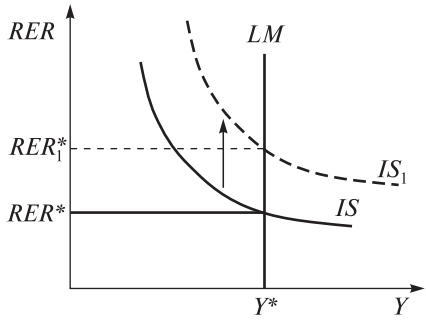

Fig. 5.3. Consequences of protectionist policy in the coordinates "income – exchange rate"

After some time, the strengthening exchange rate will negatively affect the value of exports. Net export ↓ and the IS_1 curve will return to the *IS* position.

Since the equilibrium value of income does not change, the long-term equilibrium coincides with the short-term one. Although the current account balance remains unchanged, imports and exports are falling, that is, the volume of international trade will decrease as a result of such a policy.

Thus, under a floating exchange rate, foreign trade policy does not affect income either in the long run or in the short run.

5.3. ECONOMIC POLICY IN A SMALL OPEN ECONOMY WITH A FIXED EXCHANGE RATE

When establishing a fixed exchange rate regime, the monetary policy of the central bank is reduced to maintaining it. If the rate rises, then the Central Bank must buy the currency to reduce it. When the exchange rate falls, the Central Bank, on the contrary, will sell foreign currency to increase it. Only the nominal exchange rate can be fixed, since relative fluctuations in domestic and foreign prices, even with a fixed nominal exchange rate, lead to a change

in the real exchange rate. However, in the Mundell – Fleming model, under short-term conditions, fixing *NER* automatically fixes *RER*.

1 case. The impact of fiscal policy.

Suppose the state pursues a stimulating fiscal policy. If ↑G, then the *IS* curve is shifting to the right. The exchange rate should increase. If the state wants to return the exchange rate to a fixed value, then it will be forced to increase the money supply (*M*↑) by buying foreign currency by the Central Bank. In this case, the *LM* curve also shifts to the right. With this policy, income increases in the short run, therefore, it is effective.

In the long run, prices rise, real cash will fall until *LM* returns to its original position, i.e. output will re-establish itself at the potential level. Since the nominal exchange rate is fixed, the real exchange rate will rise and net exports will fall (fig. 5.4).

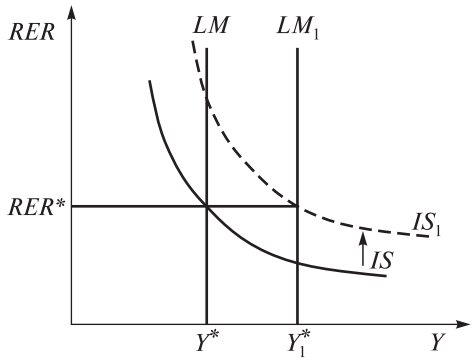

Fig. 5.4. Implications of an expansionary fiscal policy

Thus, in the long run, an expansionary fiscal policy tends to crowd out net exports.

Case 2. Stimulating monetary policy.

With a fixed exchange rate, monetary policy is reduced only to maintaining this rate, i.e. the sentence becomes an internal variable. Therefore, this policy cannot be used to change income, both in the short and long term.

The Central Bank can carry out devaluation (decrease in the fixed exchange rate) or revaluation (its increase).

Suppose the government increases the money supply by buying government long-term obligations. Graphically, the *LM* curve shifts to the right (fig. 5.5). When devaluing to maintain a new exchange rate, the Central Bank increases the money supply. The equilibrium value of income in the short run increases.

In the long run, prices will start to rise. The exchange rate falls, the depreciation of the national currency occurs.

To return it to its original level, the state is forced to buy depreciated rubles for hard currency, i.e. the value of the official foreign exchange reserves of the Central Bank will be reduced. As a result, the money supply will decrease and the *LM* curve will return to the same position, i.e. to the original course.

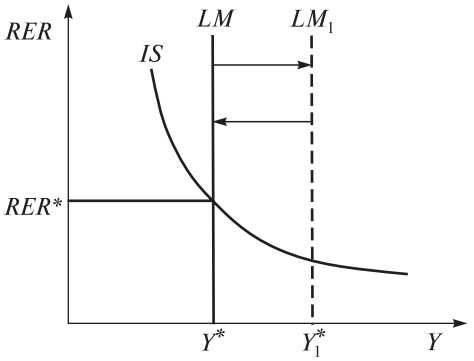

Fig. 5.5. Consequences of the devaluation

Thus, the monetary policy in the conditions of a fixed exchange rate turned out to be ineffective (in a situation of a relatively stable economy with high government confidence in the economy). Devaluation in the long run will cause an increase in the general price level, but will not affect real indicators. This is consistent with the principle of money neutrality. The money supply in this case is determined by money market speculators.

3 case. Influence of foreign trade policy.

The government pursues a protectionist policy, restricting imports. Due to the growth of net exports, the *IS* curve will move to the right. The exchange rate will increase and in order to return it to a fixed level, the state will need to increase the money supply, i.e. shift the *LM* curve to the right (fig. 5.6).

Thus, in the short term, protectionist policy under a fixed exchange rate, by increasing the current account balance, has a positive impact on income, i.e. effective.

If, in the long run, initial output was at natural levels, prices would rise, *LM* shifts to the left to its original position, the real exchange rate rises (because the nominal is fixed and the price level rises), net exports fall. In the long run, the growth of net exports, achieved as a result of protectionist policies, is not achieved, because. As a result of real exchange rate appreciation, net exports fall.

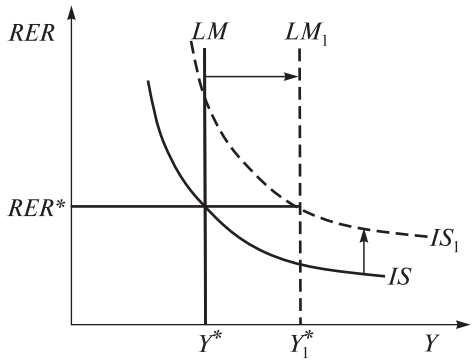

Fig. 5.6. The consequences of protectionist policies in the Mundell – Fleming model

Thus, the analysis showed:

1) the consequences of economic policy in a small open economy depend on the exchange rate system adopted in the country. In the long run, the results of economic policy for real indicators do not depend on the exchange rate adopted in the country;

2) when choosing an floating exchange rate, it is advisable to take into account the advantages and disadvantages of each.

The undoubted advantage of a floating exchange rate is the ability to automatically adapt the balance of payments when the price of the national currency fluctuates. In addition, a floating exchange rate allows the Central Bank to make full use of monetary policy instruments to achieve internal and external equilibrium, which is completely impossible with a fixed exchange rate. The advantages of fixed exchange rates include the fact that their stability provides a reliable basis for planning and pricing, positively affects underdeveloped financial markets and financial instruments.

The disadvantage of a fixed exchange rate is that the central bank loses the ability to conduct a monetary policy aimed at stabilizing employment and prices, and there is also no reliable way to determine the optimality and stability of the chosen exchange rate. The disadvantage of a floating exchange rate is its uncertainty, which makes international trade difficult.

In practice, fixed and floating rates in their pure form are rare. With a fixed rate, the government conducts devaluations and revaluations, which changes the value of the exchange rate. With a floating exchange rate, the central bank can pursue a policy aimed at stabilizing it.

The practical implementation of the Mundell – Fleming model in each country has its own characteristics. In Poland, imports of goods are influenced

by real absorption, real exports of goods and the price of crude oil. Exports of goods are affected by the real GDP of the European Union.

For Canada, Germany and the United States, the export of goods depends on the total production potential of the countries – trading partners, the real effective exchange rate. The import of goods is influenced by the real effective exchange rate and the country's potential output. The Central Bank of England, when developing export models, takes into account the following factors: the world GDP deflator, the level of international trade, the nominal effective exchange rate of the pound; for imports of goods, domestic demand, the UK GDP deflator, and the nominal effective exchange rate of the pound.

In the Swedish KOSMOS model, the export of goods depends on the ratio of domestic prices and prices of trading partners, foreign demand for export goods and the level of income of trading partner countries.

5.4. COMPARATIVE EFFECTIVENESS OF MONETARY, FISCAL AND TRADE POLICIES IN THE MANDELL – FLEMING MODEL

The Mundell – Fleming model allows one to analyze the effectiveness of the impact and consequences of monetary, fiscal and trade policies in an open economy under different exchange rate regimes and varying degrees of capital mobility. It is based on the idea of adapting the *IS–LM* model to analyze the impact of economic policy on internal and external equilibrium in a small open economy. It uses the following system of equations.

IS: $Y = C + I(r) + NX(Y, e)$ – equilibrium on the commodity, the relationship of national income Y, the rate of % r, and the exchange rate e;

LM: $M/P = L(r, Y)$ – equilibrium in the money market, the relationship between the money supply M, taking into account the price index P, and the demand for money L, which is a function of the interest rate r and the national income Y.

$r = r^*$ the domestic interest rate is determined by the level of the world interest rate r^*. So, if the interest rate in a country is higher than the world one, then foreign investors will actively rush to this country. And thus the domestic investors will be more willing to borrow abroad and take less capital abroad, because they will be more willing to invest in domestic assets. Lowering the interest rate below the world rate will have the opposite effect.

The Mundell – Fleming model is based on two graphs, the first of which (fig. 5.7, *a*) demonstrates the impact on the internal and external equilibrium of the bank interest rate (it is determined by the world interest rate), and the second (fig. 5.7, *b*) shows the impact of the exchange rate on this equilibrium.

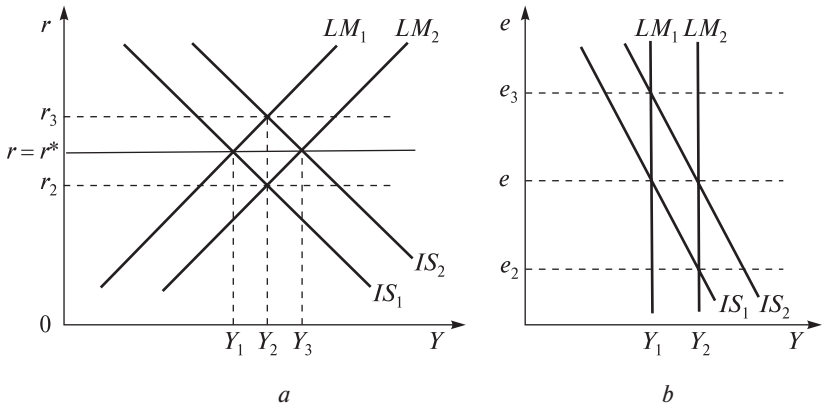

Fig. 5.7. Mundell – Fleming model:
a – the impact on the internal and external equilibrium of the bank interest rate;
b – the impact of the exchange rate on the internal and external equilibrium

In an ideal small open economy, the central bank does not interfere in setting the exchange rate in the foreign exchange market and the bank interest rate in the money market. The Mundell – Fleming model emphasizes that, under these conditions, ***monetary policy and fiscal policy will have different effects on the national economy***.

According to the Mundell – Fleming model, monetary policy in a small open economy effectively affects the volume of national income. For example, if the government increases the money supply to stimulate the growth of national income, then the result is that the LM_1 curve on both graphs shifts to the right to the LM_2 position. Then from fig. 5.7, and it follows that this will lead to a decrease in the interest rate to the level of r_2, which will stimulate the growth of national income to the level of Y_2. However, due to lower interest rates, capital outflow will increase, and therefore the balance of payments will worsen. As a result, the exchange rate will fall. Indeed, from fig. 5.7, b it is clear that the shift of the LM_1 curve to the right to the position LM_2 will lead to a decrease in the exchange rate to the position e_2. However, depreciation will stimulate the growth of net exports and, accordingly, national income. The growth of national income will lead to an increase in the demand for money and a corresponding increase in the interest rate to the previous level, i.e. world interest rate. Then, as follows from fig. 5.7, *a*, the IS_1 curve will shift to the right to the IS_2 position. A new equilibrium will be reached at the point of intersection of the curves IS_2, LM_2, $r = r^*$. This point corresponds to the level of national income Y_3, which is greater than the initial level Y_1.

Fiscal policy, on the contrary, is ineffective. Thus, if the government increases government spending and/or government investment in order to stimulate the growth of national income, then as a result, the IS_1 curve in both graphs shifts to the right to the IS_2 position until it intersects with the LM_1 curve. Then from fig. 5.7 it follows that this will lead to an increase in national income to the level of Y_2 and an increase in the interest rate to the level of r_3, which will stimulate the growth of net capital inflow and a corresponding improvement in the balance of payments. As a result, the exchange rate will rise. Indeed, from fig. 5.7, b it is clear that the shift of the IS_1 curve to the right to the position IS_2 before crossing with the LM curve will lead to an increase in the exchange rate to e_3. However, an appreciation of the exchange rate will lead to a reduction in net exports of NX, and this will continue until, due to an increase in net capital inflows, an increase in the money supply in the country does not lead to a decrease in the bank interest rate in it to its previous level, i.e. level of the world interest rate. Ultimately, despite the initial increase in national income due to increased government spending and/or public investment, the reduction in net imports as part of national income will "eat" this increase. At the same time, the exchange rate will remain higher than before – at the level of e_3.

Thus, the model of internal – external equilibrium helps to identify the relationship between internal and external equilibrium, and the Mundell – Fleming model – to understand the effectiveness of the impact of economic policy on both equilibria at the same time.

QUESTIONS

1. What do you understand by an open economy?
2. What are the characteristics of a small and large open economy?
3. What is the essence of macroeconomic equilibrium?
4. Give a description of the external equilibrium.
5. Describe the Mundell – Fleming open economy model.
6. Explain how total income, the exchange rate, and the current account will change with an increase in taxes, using the floating exchange rate Mundell – Fleming model.

6. LABOR MARKET

Basic concepts
Employment. Unemployment. Labor force. Frictional unemployment. Structural unemployment. Cyclical unemployment. Voluntary and involuntary unemployment. Unemployment rate. Full employment. Natural rate of unemployment. Oaken's law. Active. Employment policy. Passive.

6.1. LABOR SUPPLY AND THE CHOICE BETWEEN WORK AND LEISURE. NOMINAL AND REAL WAGE RATES. AGGREGATE LABOR SUPPLY CURVE. THE REACTION OF LABOR SUPPLY TO CHANGES IN PRICE LEVELS

In terms of economic content, the supply of labor is the offer by an employee of his ability to work, which is inseparable from him, and which acts as a commodity on the labor market, to the buyer of this specific product – the employer for a certain wage rate, for a certain period of time.

If the demand for labor is formed at the level of the organization (at the micro level), then the supply of labor is at the level of an industry or a set of industries, i.e. is formed as a macroeconomic category. But the formation of labor supply begins with a specific person (individual) and for this reason it has an individual character.

A simple model of labor supply is associated with individual choice and human behavior in the labor market, depending on a wide range of economic, social and psychological factors.

The simple labor supply model starts from the following assumptions:

– all the time that a person has is divided into two parts: the time of work for income and all the rest of the time, called leisure;

– when working, a person receives earnings in accordance with the wage rate and hours worked;

– the total income of an employee consists of earnings and other types of income – non-labor, not related to work (social payments, benefits, etc.);

– a person consumes a set of goods that he can acquire with his total income;

– leisure is a normal consumer good (the norm of life for any person); leisure time a person spends based on their needs, interests, opportunities;

– a person maximizes the utility of the goods consumed.

Based on this, a formally simple labor supply model can be represented as the maximization of an individual utility function:

$$U = u(C, L),$$

at the same time

$$\frac{\partial U}{\partial C} > 0 \quad \text{and} \quad \frac{\partial U}{\partial L} > 0,$$

where C is the volume of goods acquired for wages and unearned income; L is the time spent on leisure.

The total amount of time available to a person

$$T = H + L,$$

where H is the time spent on labor activity.

Existing and budgetary constraints, since the consumed set of goods cannot cost more than the wages received and unearned income, i.e. $pC = V + wH$, where p is the price of goods purchased for consumption; pC is their cost; V – unearned income; w is the wage rate per unit of hours worked; wH is the cost of all working time (labor force).

Based on the formulated restrictions $V + w(T - L)$, hence $pC + wL = V + wT$, i.e. total income (right side of the equation) equals the bundle of goods consumed at given prices plus the opportunity cost of leisure measured in terms of the wage rate (left side of the equation).

Graphically, the utility function can be represented by a family of indifference curves (J_1, J_2, J_3 in fig. 6.1) in the "goods-leisure" space. Indifference curves have the following characteristics:

– each indifference curve corresponds to a certain level of utility; all combinations of leisure (L) and goods (C) on the same indifference curve yield the same level of utility. The shift of the curves in the northeast direction (along the arrow) reflects the increase in utility ($U_3 > U_2 > U_1$);

– indifference curves slope down from left to right, since the rejection of some part of leisure must be compensated by an increase in the amount of goods consumed, and vice versa;

– indifference curves reflecting the same utility function do not intersect; the transitivity condition is satisfied.

The slope of the indifference curve is equal to the marginal rate of substitution of leisure for goods at a given point (MRS_{LC}) and the slope of the tangent to the indifference curve at a given point. The marginal rate of substitution of leisure for goods decreases as leisure increases:

$$MRS_{LS} = \frac{\partial U / \partial L}{\partial U / \partial C} = \frac{\text{The ultimate utility of leisure}}{\text{Marginal utility of goods}}.$$

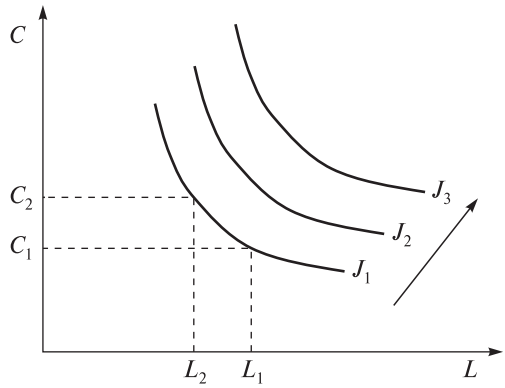

Fig. 6.1. Indifference curves
in the space "goods–leisure"

Budget constraints in fig. 6.2 reflects the broken line *abd*. Segment *ab* corresponds to unearned income *V*, segment bd corresponds to the maximum possible labor income, provided that all the time is given to work, the slope of segment *bd* is equal to the wage rate *w* per unit of work time.

$$\frac{\partial U / \partial L}{\partial U / \partial C} = \frac{w}{p}.$$

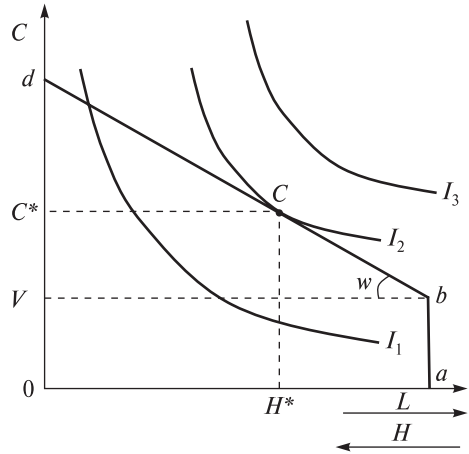

Fig. 6.2. Curves describing
the labor supply model

The individual utility-maximizing decision on the allocation of time for leisure and work is subject to the condition, i.e. the utility-maximizing number of hours of work H^* will correspond to the point c (see fig. 6.2) at which the individual marginal rate of substitution of leisure for goods (MRS_{LC}) equals the real wage offered by the labor market.

Thus, the supply of labor can be represented as a function of the real wage rate, real labor income and the amount of time that a person has

$$H = h\left(\frac{w}{p};\ \frac{V}{p};\ T\right).$$

The individual labor supply curve graphically depicts the dependence of labor supply on wages.

The labor supply curve can be made on the basis of an analysis of the change in the number of hours of work with an increase in the wage rate (fig. 6.3). Initially (fig. 6.3, *a*), the substitution effect dominates (for the essence of the effect), and with an increase in wages from w_0 to w_1, there is an increase in hours of work from H_0 to H_1, then the income effect dominates, and with an increase in wages from w_1 to w_2, the number of hours of work decreases from H_1 to H_2. The curve that connects all the points that optimize the work-leisure ratio at different wage rates is called the wage-leisure curve. It corresponds to the "price–consumption" curve in the theory of consumer demand.

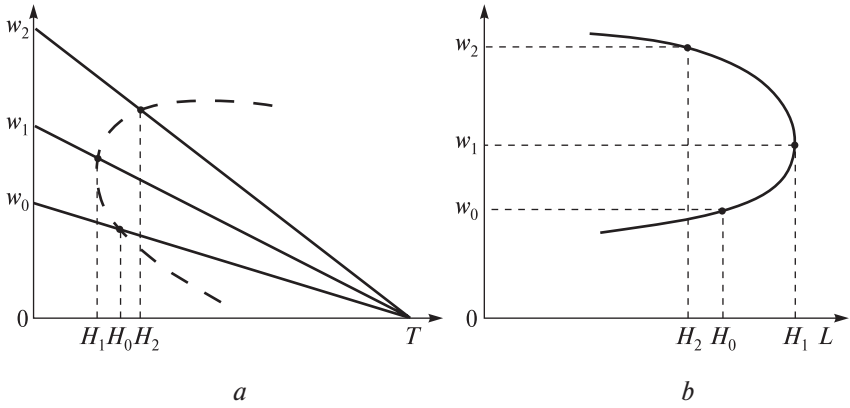

Fig. 6.3. Derivation of the individual labor supply curve:
a – space "goods– leisure"; *b* – labor market

On fig. 6.3, *b* the same decision on the choice of the number of hours of work at different wage rates is depicted in the space of the labor market.

An increase in wages from w_0 to w_1 causes an increase in labor supply from H_0 to H_1. In this section, the labor supply curve has a positive slope. An increase in wages from w_1 to w_2 causes a decrease in labor supply from H_1 to H_2. In this section, the labor supply curve has a negative slope. Thus, the individual labor supply curve has the form of a "reverse bend" curve.

If the substitution effect dominates, then the elasticity of labor supply with respect to wages is positive, and if the income effect dominates, then the elasticity of labor supply with respect to wages will be negative.

According to the model of individual labor supply, the choice between a situation where a person does not work at all, and a situation where a certain number of hours he gives to work for wages, is determined by the wage rate, unearned income and individual preferences between work and leisure.

On fig. 6.4 shows the different individual preferences of two people for the same wage rates and unearned income.

On fig. 6.4, *a*, the number of hours of work will be H_1 (the individual indifference curve and the line of budget constraints will touch at point *c*, corresponding to H_1 hours of work).

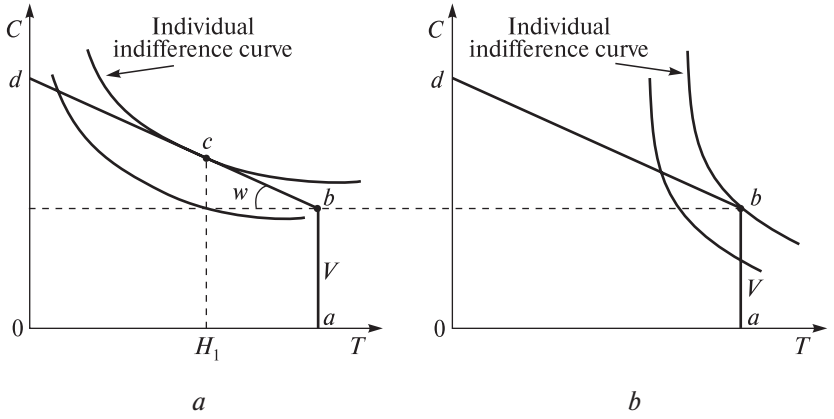

Fig. 6.4. The different individual preferences:
positive (*a*) and zero (*b*) labor force participation decisions:
abd – budget constraints (equal to total income); *ab* is unearned income (*V*);
bd – the maximum possible labor income, provided that all the time is given to work;
the slope of the segment *bd* corresponds to the wage rate *w* per unit of work time

On fig. 6.4, *b* the number of hours of work will be zero, $H_1 = 0$ (the individual indifference curve touches the budget constraint line at point *b*, corresponding to zero hours of work). The situation in fig. 6.4, *b*, when

a decision is made not to work, is called a “corner decision”. In the second case, the decision can be changed if the wage rate rises.

The minimum wage at which a person will make a positive decision to participate in organized labor is called the reserve wage (w_r).

If the wage is less than the reserve wage, then the optimal number of hours of work (H^*) that maximizes the utility of a person will be zero ($H^* = 0$ with $w < Iw_r$).

If the wage is greater than the reserve wage, then the optimal number of hours of work will be positive ($H^* > 0$ for $w > w_r$).

The reserve wage shows how much money should be offered to a person not participating in the labor force so that he gives up part of his leisure hours and gets to work.

On fig. 6.5, the reserve wage corresponds to the slope of the individual indifference curve at point A and characterizes the marginal rate of substitution of leisure by income at that point.

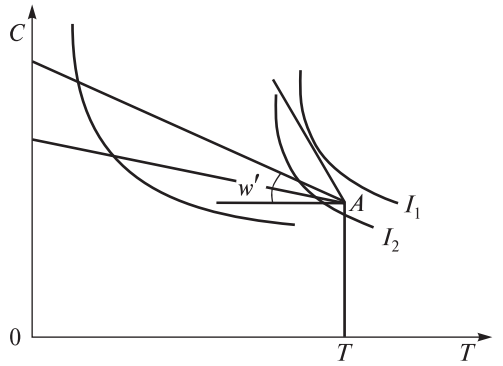

Fig. 6.5. Reserve wage curve

A change in unearned income (V) (not shown in fig. 6.5) changes the reserve wage and, accordingly, affects the decision to participate in work.

An increase in unearned income raises the reserve wage. Since leisure is viewed as a normal good, an increase in total income will lead to an increase in the value of leisure and increase the likelihood of a “corner decision” to participate in the labor force (not to work).

On fig. 6.6 shows that an increase in unearned income from V_1 to V_2 leads to a reduction in hours of work from H_1 to H_0 at point T. Accordingly, a decrease in unearned income has an inverse effect on the choice to work/not work.

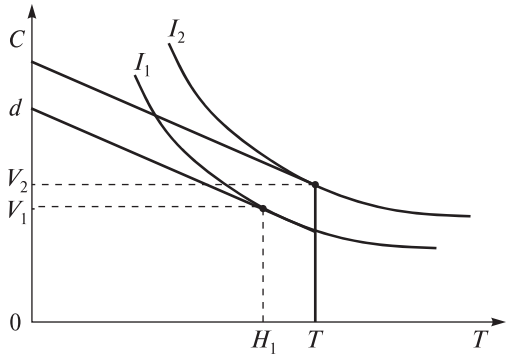

Fig. 6.6. The effect of increasing unearned income on the choice to work/not work

A simple model of labor supply (labor – leisure) shows that a person derives utility either from goods (benefits) purchased with money income from work, or from free time (leisure time).

However, leisure is a set of different activities, of which household work is a part.

The function of production in the household underlies models of time distribution; it determines how market-produced goods (C), bought with income from work, are combined with time (T)) spent at home for the production of goods (Z), i.e. the household production function can be written as follows:

$$Z = z(D, C).$$

In this case, there are restrictions:

1) $0 < D < T$, where T is all possible available time;

2) $C < wH + V$, where w is the market wage rate; H – hours of work; V is unearned income.

The household production possibility frontier is represented by the line *abd* in fig. 6.6. The slope of the curve *abc* represents the marginal productivity of domestic work, while the slope of the line *bd* represents the marginal return of labor in the market (i.e. wages).

The production function of the household is only part of the picture; in general, the household seeks to maximize not the production of goods, but the utility of all participants (household members).

The model of time distribution also assumes the division of all time between three different types of its use: leisure, production in the household, work for wages.

Jobs in the labor market and in the household, produce goods that are combined with leisure time to produce utility.

Obtaining utility from the consumption of goods Z requires costs not only for the acquisition of goods, but also the time used to consume these goods (and it could be used to earn income). Thus, the household combines market goods (C_i,) and time (T_i) to produce goods (Z_i).

Figure 6.7 shows production possibilities curve in the household.

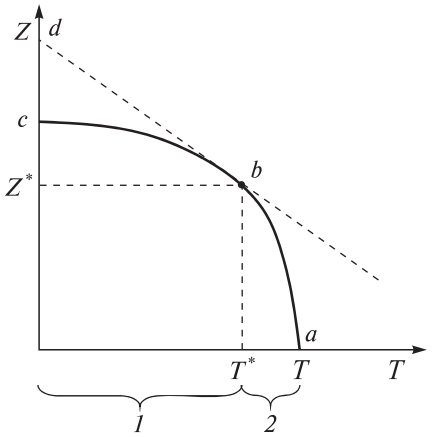

Fig. 6.7. Production possibilities curve in the household:
1 – work for wages; *2* – non-market activity

In addition to the simple model of individual labor supply, there are three models of family labor supply decisions:

1) "chauvinistic", in which the dominant family member decides on the supply of labor independently of other family members, and the rest of the family members make their decisions, considering his wages as part of unearned income;

2) a model that assumes the maximization of the overall family utility function in the presence of family budget constraints;

3) a model that considers the maximization of individual utility in the presence of family budget constraint.

In the "chauvinistic" model of a family decisions on the supply of labor, the head of the family, independently of other family members, maximizes his utility function and finds the optimal number of hours of work H_m^*

$$H_m^* = h_m^*\left(\frac{w_m}{p}; \frac{v_m}{p}\right).$$

This number of hours of work corresponds to income from labor activity Y_m^*

$$Y_m^* = \left(\frac{w_m}{p}\right) H_m^*.$$

When H^* and Y^* are determined, the other spouse maximizes his utility function $Uf = uf(C_f, L_f)$ based on the decision of the head of the family. At the same time, his budget restrictions will include both his own income and unearned income, which includes the actual unearned income of the family v_h and the earnings of the head of the family:

$$\left(\frac{w_f}{p}\right) = H_f + \left[\left(\frac{v_h}{p}\right) + Y_m\right] \geq C_f.$$

In a model that assumes the maximization of the family utility function in the presence of family budget constraints, the utility function has the form

$$U_h = u_h(C_1, C_2, ..., C_k, L_1, L_2, ..., L_n).$$

That is, the consumption of various goods by n family members is maximized. If the prices of goods remain in the same proportion, then the set of goods can be represented as a complex aggregated good C_n and the utility function will take the form

$$U_h = u_h(C_n, L_1, L_2, ..., L_n).$$

Family budget constraints will look like

$$\sum_{i=1}^{n} w_i H_i + V_h \geq \sum_{j=1}^{k} C_j P_j$$

or taking into account the reduction of a set of consumer goods into a single aggregated good C_u.

$$\sum_{i=1}^{n}\left(\frac{w_i}{p}\right) H_i + \left(\frac{V_h}{p}\right) \geq C_h, \;\; H_j = T - L_j.$$

The solution to this model is the set of optimal working hours for each family member

$$H_i^* = h_i^*\left(\frac{w_1}{p}, \frac{w_2}{p}, ..., \frac{v_h}{p}\right).$$

Thus, the number of hours worked by each family member depends on the real wage rate of other family members, the price of consumer goods and unearned income.

The higher the salary of one of the spouses, the lower, all other things being equal, the propensity of the second spouse to participate in the labor force, since the first has a comparative advantage in the labor market. At the same time, the solution will depend on the type of utility function. The less utility the second spouse associates with non-market activities, the more he will be inclined to work in the market.

If the intra-family cross-substitution effect is equal to zero (i.e., the labor supply of none of the family members does not depend on the wages of other family members), then the model solution will take the form:

$$H_i^* = h_i^*\left(\frac{w_1}{p}, \frac{w_2}{p} + \sum\nolimits_{g\neq i}^{n}\left(\frac{w_g}{p}\right)H_g\right).$$

In this case, the only factor by which other family members influence the decision on the labor supply of the i-th family member is the family income, which is now formed from V_h and the sum of labor incomes of other family members ($g = 1, ..., n; g \neq i$).

The model, which assumes the maximization of individual utility functions under family budget constraints, emphasizes the role of the individual in making family decisions. This model considers the maximization of individual utility when it is a function of individual leisure and family consumption.

One variant of such a model is based on the duopoly model. The curve of the first spouse H_i/H_m and the curve of the second spouse H_j/H_m are shown in fig. 6.8.

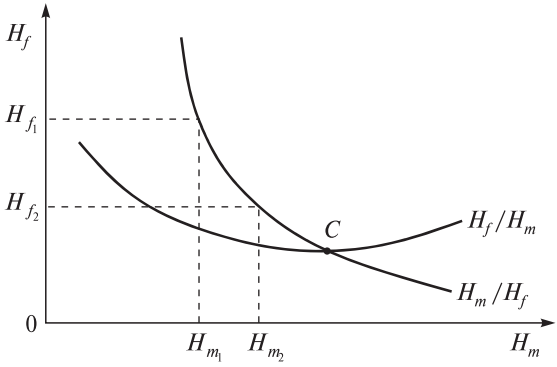

Fig. 6.8. Family decision curves based on the duopoly model

Each spouse response curve shows the optimal (individual utility maximizing) choice of the number of hours a given, spouse works given a

given number of hours the other works. If the second spouse offers H_{f_1} hours of work, then the optimal choice for the first spouse is H_{m_1} hours of work. However, this solution is unstable. In response to the first spouse's choice of the number of work hours H_{m_1}, the second spouse will optimize his behavior and choose H_{f_2} hours of work.

This process will continue until the decision on the choice of hours of work corresponds to the point *C* on the reaction curves of the spouses (*C* is the point of intersection of the reaction curves). In this case, *C* is the point of stable equilibrium for both spouses. But if the slopes of the reaction curves are reversed, then the point *C* will not characterize a stable equilibrium.

A sufficient condition for the existence of a stable equilibrium is that consumption goods are normal for both spouses.

The entry of a person into the labor market, as a rule, is associated with fixed costs (monetary or in the form of time). These costs do not depend on the number of hours of work, but have an impact on the reserve wage and the number of hours of work that maximize human utility.

Fixed cash costs are the payment for public transport, the purchase of special (working) clothing, shoes. After entering the labor market, a person immediately bears these costs, having not yet received wages for his work. This circumstance makes work in the labor market less attractive for some groups of the population compared to work in the household.

In addition, the entry of a person into the labor market leads to a constant cost of travel time to and from work, which also makes work less attractive than leisure.

The existence of fixed costs associated with entry into the labor market also leads to a reduction in unearned income (for example, the discontinuation of welfare benefits for people who have incomes below the subsistence level).

Every person faces a dilemma: work more or rest more. It becomes more acute when the situation changes. Suppose, at the moment, the maximum income that we could earn in 24 hours is B dollars. The maximum number of hours in a day, of course, is 24. Therefore, our budget constraint "income–free time" can be expressed by a straight line (fig. 6.9). It is impossible to accept point *B* as a solution, since no one is able to work 24 hours a day for a more or less long period.

In fact, labor is a kind of commodity, but it is not the hired worker that is being sold, but his working time. It has natural limits and must certainly be less than 24 hours, since part of the day is necessary for a person to rest, to restore his ability to work. Therefore, the situation shown in fig. 6.9, where equilibrium is reached at point *E*. In this case, free time is H_0, working time is $(24 - P_0)$,

daily income $I_0 = w(24 - H_0)$. The slope of the budget constraint is equal to w, the wage rate. This means that a worker maximizes utility when the marginal rate of substitution of income for leisure time equals wages $MRS_{IH} = w$.

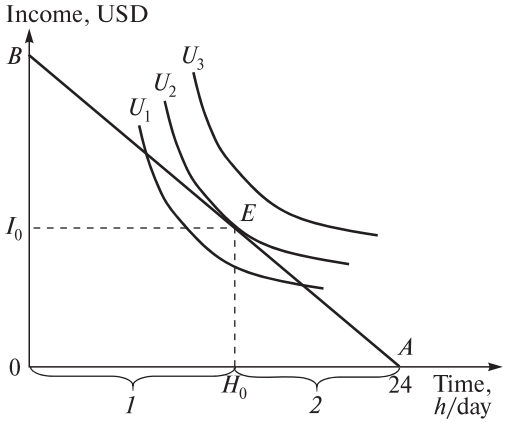

Fig. 6.9. The choice between work and rest:
1 – freedom time; *2* – workers time

Suppose the wage rate has increased from w_1 to w_2. The budget constraint shifts from AB to AB_1 (fig. 6.10). Work in this case becomes more attractive, which causes a desire to work harder. Equilibrium shifts from point E_1 to point E_2 (see fig. 6.10). If we draw a budget constraint CD parallel to AB_1 and tangent to the indifference curve U_1, we can determine the substitution and income effects. The substitution effect is expressed in the reduction of free time and the growth of wages. Graphically, this means moving from H_1 to H_3. However, with the growth of income, the value of such a normal good as leisure is increasing – free time for personal development. The income effect is directed in the opposite direction and is equal to the segment R_3R_2. Thus, at this stage of wage growth, the substitution effect exceeds the income effect. This means an increase in working hours with an increase in wages; the individual labor supply curve has a positive slope (fig. 6.11).

However, a further increase in income dulls the desire to work. The individual begins to appreciate free time more and more (besides, the increase in the working day has its limits). This leads to the fact, that the income effect begins to exceed the substitution effect (fig. 6.12). As a result, working time is reduced from $(24 - H_1,)$ to $(24 - H_2)$, and free time increases from H_1 to H_2. This response to wage growth causes the individual labor supply curve to slope negatively (fig. 6.13).

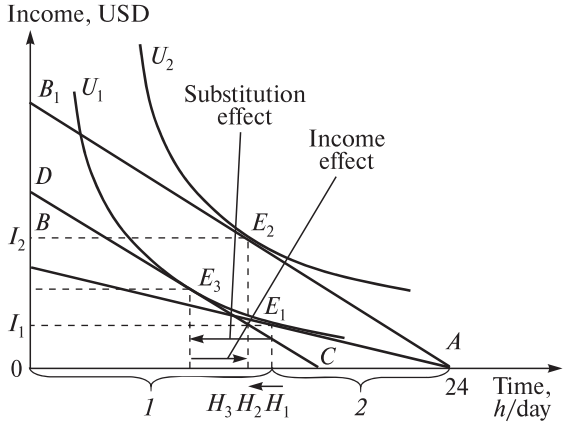

Fig. 6.10. Wage growth: substitution effect exceeds income effect:
1 – freedom time; *2* – workers time

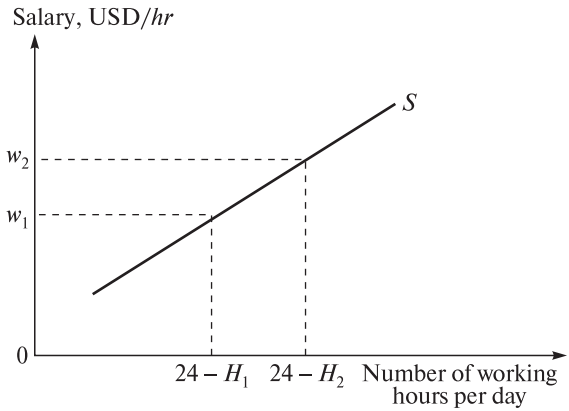

Fig. 6.11. Increase in the working day with an increase in wages

As wages rise, there is usually a desire to work harder. However, this desire also has its limits, since one has to sacrifice leisure – hours of free time. With the growth of wages, the price of rest becomes higher and higher. Therefore, sooner or later a moment comes when an increase in wages leads not to an increase, but to a reduction in working hours.

Wages are a form of material remuneration for labor, a part of the cost of created and sold products or services received by employees of enterprises and institutions. Salary is a value category. Under all conditions, it must be

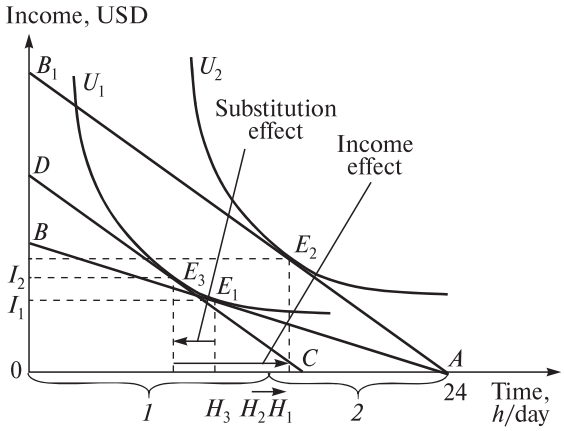

Fig. 6.12. Wage growth: income effect outweighs substitution effect:
1 – freedom time; *2* – workers time

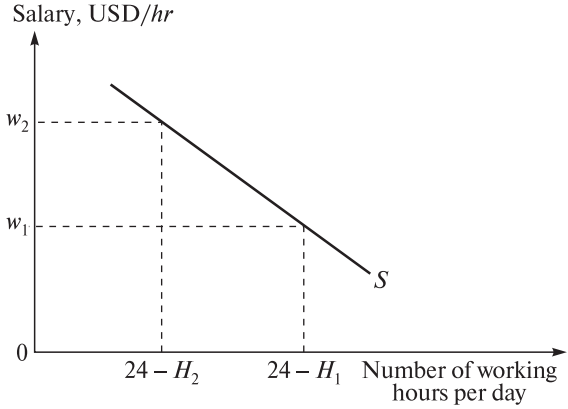

Fig. 6.13. Shortening of the working day with an increase in wages

based on the amount of means of subsistence objectively necessary for the reproduction of the labor force. Payroll costs are an element of production costs. The minimum wage is designed to ensure normal conditions of reproduction for the worker performing the least difficult work. The amount of such wages is usually determined by calculating the subsistence minimum, which is calculated according to the standards for meeting the needs of an employee in goods and services, taking into account the price level.

The wage regulator in economic systems with elements of active state regulation can be a centrally developed and approved ***tariff scale*** – a set of standards that regulate the level of wages of workers.

When deciding on the amount of wages, it is important not only how much money the employee will have, but also what he can buy with this money. In other words, the purchasing power of money is determined by the ratio of nominal and real wages.

The ***nominal wage*** is the amount of money received by the worker at the cash desk.

Real wages are the amount of goods and services that can be purchased with a given nominal wage.

Based on various assessments, time-based, piecework and bonus forms of remuneration are distinguished.

When calculating ***time wages***, the time spent on productive work is taken into account. Time wages in developed countries are mostly calculated on an hourly or weekly basis, while employees and management are paid on a monthly basis. Time wages are applicable to jobs that require attention, care and mental activity.

With ***a piece-rate assessment*** of the calculation of the number of products produced. It also uses an hourly rate, which is converted to the quantity of the product and is called the rate for piece work. If it is created in money for the sale of products, then this is a monetary rate. If it is calculated in terms of the time required to perform a single job, then it is called a piece-time rate. The rate of piece work must comply with the procedure for determining the norms of time productivity. The piecework form is used to pay for the same type, limited, regularly recurring, measurable activities of individual workers or groups of individuals.

Premium pay is introduced if the expansion of technical facilities and high-performance complex machines makes it impossible to use performance-based pay. But even with this form of payment, normal performance is taken as the basis. If it is higher, then the employee receives an additional bonus in addition to the basic payment.

Aggregate supply is the model shown in fig. 6.14 in the form of a curve which shows the level of available real output at each possible price level. Higher price levels create incentives to produce more goods and offer them for sale. Lower price levels cause a reduction in the production of goods. Therefore, the relationship between the price level and the volume of the national product that enterprises throw into the market is direct, or positive.

In the course of macroeconomic analysis, we have learned that there is great disagreement about the nature and shape of the aggregate supply curve.

But now it is important for us to remember that this curve consists of three definite segments, or segments. We will also proceed from the fact that the aggregate supply curve itself does not shift.

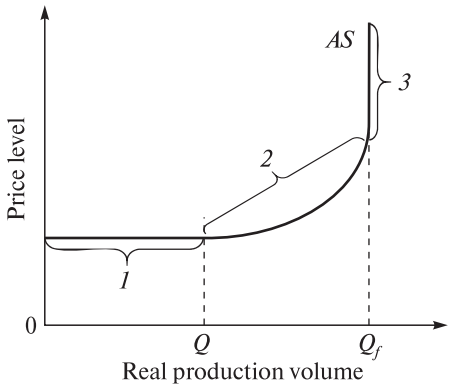

Fig. 6.14. Aggregate supply curve:
1 – horizontal, or Keynesian, segment;
2 – ascending, or intermediate, segment;
3 – vertical, or classical, segment;

Three segments of the aggregate supply curve are defined as: 1) Keynesian (horizontal); 2) intermediate (deviating upwards) and 3) classical (vertical) segments. Let's examine these three segments and give them an explanation. The shape of the aggregate supply curve reflects the change in unit costs as national output increases or decreases. Recall that the cost per unit of output can be calculated by dividing the value of the total inputs (resources) used by the volume of output. In other words, the cost per unit of output at a given level of output is the average cost per unit of output.

Keynesian (horizontal) segment

On fig. 6.14 denotes the potential level of real national output at full employment. Recall that the natural rate of unemployment arises at this level of national product. Note that the horizontal segment of the aggregate supply curve includes real national output, which is much less than national output at full employment, Q_f. Therefore, the horizontal bar indicates that the economy is in a deep recession, or depression, and that a large amount of machinery, equipment and labor is not being used. These unused resources, both labor and material, can be brought into play with little or no pressure on the price level.

When the volume of the national product begins to increase in this segment, neither shortages nor bottlenecks in production that can drive up prices arise. A worker who has been out of work for two or three months is unlikely to expect a pay rise when he returns to his job. Since producers can purchase labor and other inputs at fixed prices, production costs will not increase when production expands, and therefore there will be no reason to increase the prices of goods. Conversely, this segment also assumes that if real output falls, the prices of goods and resources will remain at the same level. This means that real output will decrease, but commodity prices and wages will remain unchanged. In fact, the real volume of the national product and employment in this segment will decrease due to the constant level of prices and wages.

Classical (vertical) segment

Moving to the right along the curve, we see that the economy has reached full, or natural, unemployment for a given output, Q_f. The economy is at a point on its production possibilities curve where no further increase in output can be achieved in the short term. This means that any further increase in prices will not lead to an increase in its real volume, since the economy is already operating at full capacity. At full employment, individual firms may attempt to expand production by bidding more for inputs than other firms. But the resources and additional volume of product that one firm will receive, another will lose. As a result, the prices (costs) of inputs and ultimately the prices of goods will increase, but real output will remain unchanged.

Two remarks should be made about the vertical segment of the aggregate supply curve. First, this segment was considered by classical economics, according to the conclusions of which, due to certain forces inherent in the market economy, full employment becomes the norm. Therefore, the vertical segment is also called the classical segment of the aggregate supply curve. Second, "full employment" and "real national output at full employment" are slippery terms. This is true not only because the working day and the size of the labor force can sometimes be increased beyond normal limits. Recall that periodically actual GNP exceeds potential GNP. So, in the phase of prosperity of the economy, the daily working day and the working week can increase. Workers can also resort to part-time work, that is, to such a practice when a person works in two places.

Intermediate (ascending) segment

Finally, in the intermediate interval between Q and Q_f, we see that an increase in real national output is accompanied by an increase in the price level. Why? One reason is that the entire economy is practically made up

of innumerable product and resource markets, and full employment occurs unevenly and not simultaneously in all sectors or industries. Therefore, when real national output reaches the interval Q and Q_f, for example, the computer industry, which is characterized by high technology, may experience a shortage of skilled workers, while significant unemployment may remain in the automobile or steel industry. In some industries, there may be shortages and other bottlenecks in production. The expansion of production also means that when it reaches full capacity, some firms will have to use older and less efficient equipment. As production increases, less skilled workers are hired. For all these reasons, unit costs increase, and firms must charge higher prices for goods in order to be profitable. Therefore, in the intermediate period, an increase in the real volume of the national product is accompanied by an increase in prices.

We have already said that some economists, who are called representatives of the classical or neoclassical school, argue that the entire curve is vertical, and changes in aggregate demand are relatively harmless, since they affect only the price level and do not affect output and employment. Others, known as Keynesians, believe that the aggregate supply curve is either flat or ascending and that therefore such a decrease in aggregate demand has negative and very costly consequences for production and employment.

6.2. DEMAND FOR LABOR. PRODUCTION FUNCTION. THE MARGINAL PRODUCT OF LABOR, ITS GRAPHIC ILLUSTRATION. REAL WAGE RATE. FACTORS OF CHANGES IN LABOR DEMAND

The demand for labor is the quantity of labor services that the employer is willing to hire at certain wage rates. To characterize it, it is necessary to recall the theory of production, where the foundations of the theory of demand for resources were considered. Let us recall its main provisions in relation to the labor market:

1) the demand for labor depends on its productivity;

2) the demand for labor services rises as the price of the goods they produce rises;

3) demand for labor depends on the prices of other inputs;

4) the marginal profitability of labor (MRP_L) is equal to the marginal product of labor (MPL) times the marginal revenue (MR) of the firm:

$$MRP_L = MR \cdot MP_L;$$

5) a profit maximizing firm will demand labor until the marginal revenue from the use of the labor factor is equal to the cost associated with its purchase, that is, wages.

Under perfect competition, marginal revenue equals the price of output. Therefore, substituting wages W instead of MRP_L, and price P instead of MR, we get:

$$W = MP_L \cdot P,$$

$$MP_L = W/P.$$

In this case, the volume of demand for labor will depend on two key indicators: the marginal productivity of the worker and the amount of wages.

Consider a graphical illustration of the demand for labor of an individual firm (fig. 6.15).

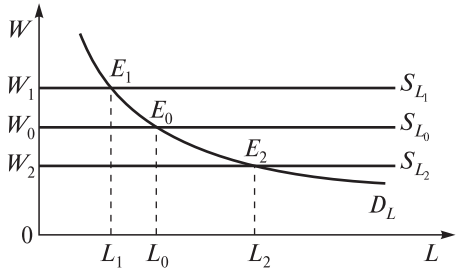

Fig. 6.15. Formation of demand in the labor market in conditions of perfect competition (for the firm)

In conditions of perfect competition, the price of labor power is the same for everyone (as for any other commodity), that is, all workers receive equal wages.

This means that for the firm, the supply of labor is perfectly elastic, therefore, the marginal cost of labor $MRC = W$ and the labor supply curve takes the position S_{L_0}. Then the firm will hire workers up to L_0 as long as the marginal cost of the labor resource is below the marginal profitability of the resource.

If wages rise, the supply curve will move to S_{L_1} and the demand for labor will be reduced to L_1.

If the wage rate is reduced, then the supply will be represented by the curve S_{L_2}, and the volume of demand will be increased to the level L_2.

We examined the impact on demand of the ***price factor*** – changes in wages. But the demand for labor is a value dependent on many other, non-price factors. Some of them have already been named and relate to the derivative nature of the demand for labor (dependence on the demand for the product of labor and on the prices of other resources). Let's add a few more non-price factors to them, namely:

– presence of other factors of production;

– efficiency of use of other production resources;

– operating capital;

– state of the art and technology;

– Labour Organization;

– the quality of the labor force (level of education, professional experience, personal qualities, etc.);

– state of the economy (phase of the economic cycle).

Under their influence, the demand for labor will change. Thus, in a period of economic recession, even if wage rates remain unchanged, the demand for labor will decrease.

Job offers are based on the exchange of labor services for compensation, which can be described in terms of the work time offered and the abilities and knowledge an individual possesses.

As regards the supply of labor, it will primarily depend on the decision of the individual worker to sell or not to sell his labor power, and if so, in what quantity. The transformation of labor power into a commodity occurs under the following circumstances:

– the owner of the labor force has personal freedom to dispose of it at his own discretion;

– the owner has no means of subsistence;

– the owner of the labor force does not have other factors of production that can bring him income.

Making this decision, a person makes a choice between free time and the ability to consume a certain amount of goods and services. The preference given to leisure (leisure, entertainment, household chores) means at the same time a decrease in the opportunity to earn money for the purchase of any consumer goods and vice versa.

You are already familiar with the principles of the optimal choice of the consumer, therefore, in relation to this situation, the problem is solved as follows. A person will strive to balance the benefits of leisure and work so that the marginal utility of one hour of leisure is equal to the marginal utility of the goods and services that can be purchased with earnings from an hour of work. Then the hourly rate of wages will act as the opportunity cost of one hour of leisure, that is, the cost of those goods that must be sacrificed for the pleasure of prolonging entertainment or rest for an hour.

Let's see how the increase in the wage rate will affect the supply of labor. On the one hand, there will be a ***substitution effect***: the desire to work harder in order to purchase more goods and services with the money earned. On the other hand, there may be an ***income effect***: the desire to have more free time, since higher wages increase income and allow you to work less, providing the usual set of consumer goods.

At low wage rates, the substitution effect prevails, so if wages start to rise, then the supply of labor rises. But as wages rise, the income effect increases and the supply of labor decreases. The action of the substitution effect and the income effect allows us to present the labor supply curve of an individual worker in the following form (fig. 6.16).

Before point *K*, there is a substitution effect; after point *K*, there is an income effect. However, in the market as a whole, this trend will be offset by the supply of other workers who will move from other areas of employment, focusing on higher wages. Therefore, the supply curve in the market for this type of labor will have the usual form (fig. 6.17).

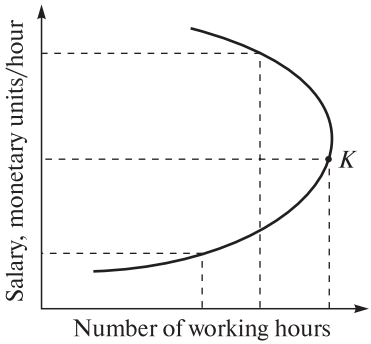

Fig. 6.16. Individual labor supply curve

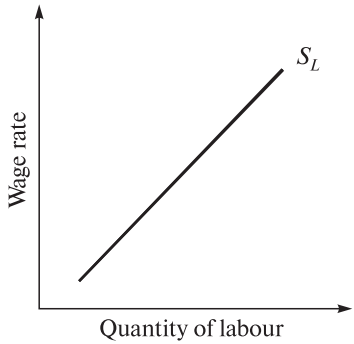

Fig. 6.17. Industry labor supply curve

The S_L curve will be determined by the marginal cost of hiring labor, i.e. *MRC* (or *W*).

So, the supply of labor services, as well as the demand for labor, is primarily affected by the price factor – the amount of wages. However, the impact of ***non-price factors*** on labor supply is also palpable. If we are talking about an individual employee, then they should include:

– family composition (number of dependents);
– the size of the family budget;
– the level of education;
– place of residence (urban or rural area);
– personal goals and values (career, wealth, free time, creativity);
– psychological characteristics of personality (character, temperament).

If we talk about the supply of labor on the scale of an industry or region, then the following non-price factors can be noted:

– demographic factor (number of working-age population);
– degree of economic activity of the population (desire to work);

– income level of the population;
– intensity of migration processes.

The interaction of supply and demand in the labor market leads to the formation of the price of labor – wages and the determination of the volume of hired labor resources.

The formation of the equilibrium parameters of the labor market (the equilibrium wage rate and the equilibrium volume of employed workers) is shown in fig. 6.18.

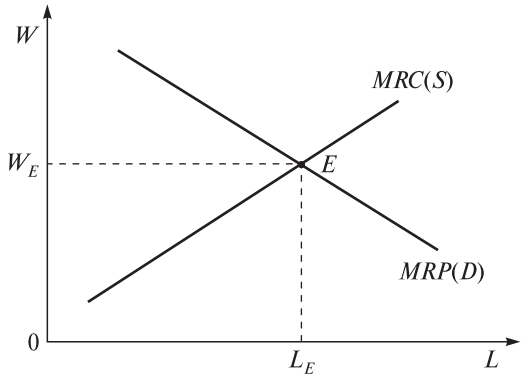

Fig. 6.18. Equilibrium of the labor market under perfect competition

If we turn to the graph (see fig. 6.18), then for the industry in conditions of perfect competition, the equilibrium wage W_E and the equilibrium volume of labor L_E will be established, corresponding to the intersection point of the labor demand curve (*MRP*) and the labor supply curve (*MRC*). If we turn to the graph (see fig. 6.18), then for an industry in conditions of perfect competition, equilibrium wages W_E and equilibrium labor force L_E will be established, corresponding to the intersection point of the labor demand curve (*MRP*) and the labor supply curve (*MRC*).

6.3. EQUILIBRIUM IN THE LABOR MARKET. REAL WAGE RATE AND EMPLOYMENT RATE. THE CONSEQUENCES OF CHANGES IN THE SUPPLY AND DEMAND OF LABOR

Under the influence of trade unions and the state, monopoly and monopsony can arise in the labor market, which will violate the conditions of perfect competition.

Consider first the ***monopoly*** on the demand side, that is, ***monopsony***. An employer can become a monopsonist, that is, the only employer in the labor market, under the following conditions:

1) on the labor market, on the one hand, a significant number of skilled workers who are not united in a trade union interact, on the other hand, one large monopsonist firm or several firms united in a group and acting as one employer of labor (for example, tunnel miners on one side and a mine or coal syndicate on the other side);

2) a monopsonist hires the bulk of the total number of specialists in a certain profession (for example, the owner of a fishing vessel hires fishermen);

3) the type of labor does not have high mobility (the same services of fishermen due to geographical disunity, the need to retrain in a new specialty);

4) the monopsonist firm itself sets the wage rate, and workers are either forced to agree with it or look for another job.

In a monopsony, a monopsonist firm (buyer of labor) receives monopoly market power, i.e. the ability to influence the price of labor (wage rate). It achieves this by reducing the number of employees it employs. As a result of increased competition between workers (sellers of labor), their wages fall below the equilibrium level. Let's illustrate this graphically (fig. 6.19).

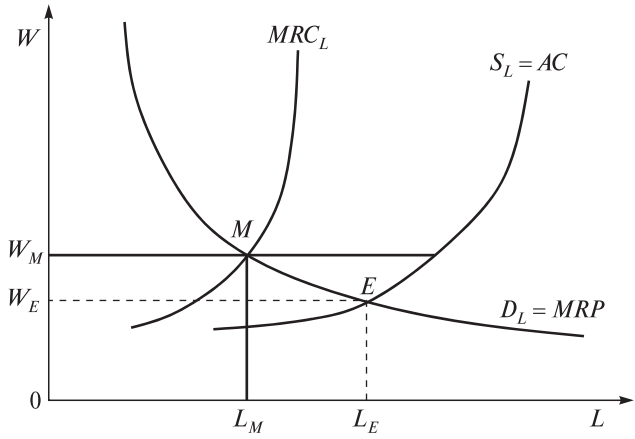

Fig. 6.19. The labor market under monopsony

If, under perfect competition, the labor supply curve for a firm in an industry was represented as a marginal cost curve, then for a monopsonist firm it will be an average cost curve, since the labor supply for the firm and for the industry is the same ($S_L = AC$).

To attract an additional worker, the firm needs to raise the wage rate. But this will have to be done not only for the additionally hired employee, but for all those already previously hired, otherwise labor conflicts are inevitable. For example, a company employs 150 workers who receive 100 rubles per hour. (100 rubles are the average costs of the company per employee). To hire the 151st worker, the firm raises the hourly wage rate by 3 rubles (up to 153 rubles per hour). But, however, a new employee will cost the company not 153 rubles (as it seems at first glance), but at 553 rubles, since the increase in the hourly rate by an additional 3 rubles. will happen for all the other 150 people. The total cost of acquiring labor will increase from 15,000 rubles (150 · 100) (up to 15 453 rubles). The marginal cost of hiring the 151st employee will be 553 rubles. The same pattern will be repeated when the 152nd and subsequent workers are hired.

If we represent this situation graphically, then the marginal cost curve for the purchase of labor will be located above the average cost curve (see fig. 6.19).

In a situation of perfect competition in the market, the equilibrium would be established at point E. This equilibrium corresponds to the wage rate W_E and the number of employed workers L_E.

However, under monopsony, the equilibrium level of employment is determined by the intersection of the marginal cost curve MRC_L with the marginal income curve of labor in monetary terms (labor demand curve – D_L). Equilibrium will be established at point M. The equilibrium level of employment will be E_M, which is less than L_E (the level of employment of a competitive market).

As for the wage rate, it is determined not at the intersection point of MRC_L and MRP_L, but below, and its level will be W_M.

Thus, in a monopsony, L_M workers will be hired at a rate of W_M. That is, the monopsonist firm will hire fewer workers and pay them lower wages.

Now let's consider a *labor market model in which the trade union of the industry is the monopolist of the labor supply*. In this case, the conditions for the sale of labor are determined not by an individual contract between the seller and the buyer, but by a collective agreement between the members of the trade union and the employer. However, one trade union can be opposed by many firms that do not act together, or maybe one monopsonist employer. Let's consider both of these cases.

When a *trade union faces a market of freely competing employers*, its demand for higher wages leads to a reduction in employment. For example, if the hourly wage rate is 100 rubles. if 300,000 workers can be involved, then by demanding an increase in wages to 105 rubles, the trade union reduces the possibility of using a certain number of workers, since at this price employers will be able to hire only 250,000 people per year. Why is this happening? The easiest way to explain this is with the help of a graphical model (fig. 6.20).

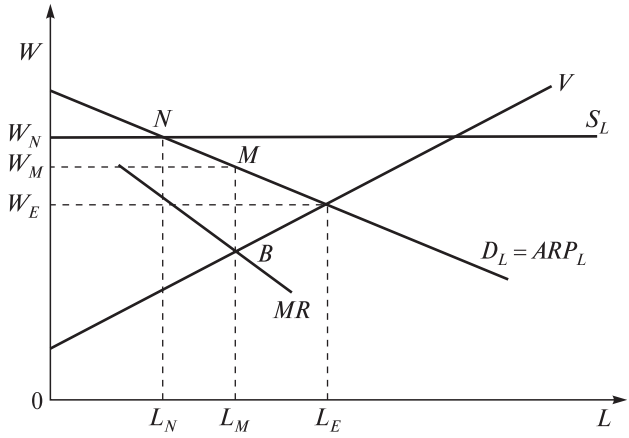

Fig. 6.20. Labor market with a trade union

Since there are many employers, the industry demand curve for labor becomes the average revenue curve for the union ($DL = ARP_L$), and the marginal revenue curve *MR* runs below the demand curve.

Then the coordinate of point *B* on the *L* axis (point B corresponds to the conditions of optimal choice: *MRP* = *MRC*) will correspond to the number of employees (L_M), and the coordinate of point *M* on the *W* axis will correspond to the wage rate (W_M). Compared to the equilibrium values (L_E and W_E), employment will decrease and wages will increase.

A trade union may, under the threat of a strike, also demand the establishment of a minimum wage rate above the equilibrium, for example, W_N. If employers agree, then for them the labor supply curve will become absolutely elastic and turn into a straight line $W_N V$. In this case, the employment and labor price indicators will be the coordinates of the point *N* (L_N and W_N). Of course, the trade union cannot but worry about such a consequence of its actions as a reduction in employment. Therefore, along with the struggle for an increase in wage rates, he can take measures leading to an increase in employment. Trade unions can carry out their actions in two directions:

1) contribute to the growth of demand for labor;

2) contribute to reducing the elasticity of labor demand.

The demand for labor will grow if:

1) the demand for goods manufactured in the industry increases (then, due to the derivative nature of demand, the need for appropriate labor services will also increase);

2) the volume of production in the industry will increase;

3) prices for substitute resources will rise.

Then the first group can include such actions as advertising products of their industry, raising the minimum wage in industries where workers work, potentially able to replace those employed in this industry. Trade union measures aimed at limiting the use of resources that replace human labor will contribute to reducing the elasticity of demand for labor. But the NTP stands as a barrier to such events, so the actions of trade unions aimed at increasing wages, most often still lead to a decrease in employment.

Now let's look at the situation on the labor market, when *one trade union is opposed by one employer, that is, a monopoly collides with a monopsony*. This situation is called a two-way monopoly.

A ***two-way monopoly*** is a situation in the labor market when the monopoly of the buyer (monopsony) is opposed by the monopoly of the seller (trade union). Let's analyze this situation graphically (fig. 6.21).

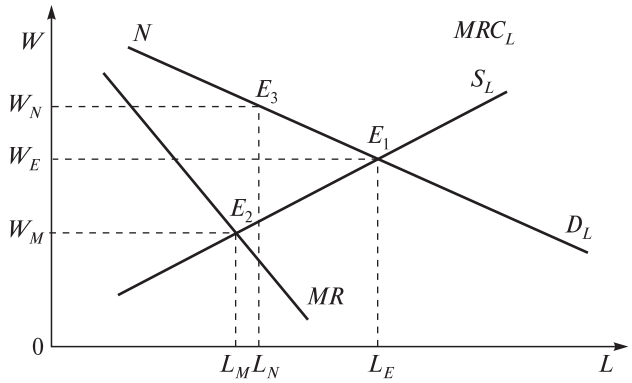

Fig. 6.21. Bilateral monopoly on the labor market

In conditions of perfect competition, the equilibrium would be established at point E_1: L_E workers would be hired at the wage level W_E. But the monopsonist firm will seek to *reduce wages to the W_M level by reducing employment to L_M*. The union will also try to raise wages to the level of W_N, also reducing the labor supply to L_N. With minor differences in the number of hired workers, the positions of the monopolist-buyer and the monopolist-seller relative to the level of wages differ significantly.

The result depends on the degree of cohesion of the labor movement and on the degree of monopoly power of the monopsony. In practice, we are dealing

with a compromise solution that is worked out in the process of concluding collective agreements between both parties.

The result of the interaction of supply and demand in the labor market is the establishment of wages. As an economic category, wages have a dual nature. On the one hand, ***wages are a monetary form of the price of labor***, and on the other hand, it is a *form of reproduction of the worker's means of living*. Therefore, all other things being equal, it is equal to the monetary expression of the marginal product of labor, but at the same time, it must cover the costs of meeting the needs of the employee, allowing him to reproduce his ability to work. And since both individual productivity and labor reproduction costs cannot be the same for everyone, there is a differentiation of wage rates in the labor market.

The main reasons for the differentiation of wage rates are the following:

– differences in the abilities, educational level, qualifications, experience of individual employees;

– differences in the attractiveness of different types of activities;

– differences in working conditions (unfavorable, harmful and dangerous conditions require higher compensation);

– regional and sectoral wage differences;

– wage discrimination based on gender, age, nationality (although it is officially prohibited).

A stable factor determining the differences in the level and ratios in wages is human capital.

Human capital is a person's accumulated stock of physical health, knowledge and professional skills.

Human capital involves certain investments in education, a healthy lifestyle, and professional development. Sources of investment in human capital are the individual's own funds, the company's funds (for example, for training or improving working conditions), as well as state funds in the form of the implementation of various social programs. Later, the costs materialize in higher productivity and quality of labor, and, consequently, in higher wages.

There are two main forms of wages: time-based and piecework.

Time-based salary is the payment of labor depending on the length of time worked.

The wage rate for the time-based form of salary is the payment for labor services per hour of labor time.

Piecework wages are wages depending on the quantity of products produced.

In this case, the unit price is determined by dividing the hourly wage rate by the hourly output (labor productivity) at normal labor intensity.

How do productivity and labor intensity differ from each other?

Labor productivity is the result of the use of labor, determined by the number of products produced by an employee per unit of time.

Labor intensity is the cost of labor per unit of time. Therefore, piecework wages can stimulate not only an increase in output, but also the intensification of labor. As a result, the quality of products decreases, the labor force "wears out" faster and more costs are required to restore it.

In different countries, the ratio in the use of piecework and time-based forms of wages varies. So, in the USA, time-based remuneration prevails, and in Russia, until now, they preferred the piecework form of remuneration.

There are nominal and real wages.

Nominal salary is the amount of money that an employee receives for a certain period of time. It is fixed in the payslips or other documents, does not depend on the price level and cash expenses of the employee. Nominal wages tend to increase, as the qualitative characteristics of the labor force (education, qualifications, etc.) increase.

Real wages are the amount of goods and services that can be purchased for a given nominal wage. Real wages are determined by:

– the size of the nominal salary;

– the level of prices for consumer goods and services;

– the amount of taxes paid from wages.

To calculate the real salary, it is necessary to divide the nominal wage index by the consumer price index.

The dynamics of nominal and real wages, as a rule, do not coincide, moreover, it may be the opposite (in a period of high inflation, nominal wages may rise, and real wages may fall).

Payroll functions:

1) reproductive – wages must be sufficient to reproduce the ability to work of workers and their family members;

2) stimulating – remuneration of labor should contribute to the growth of labor activity of the able-bodied population and the growth of labor productivity;

3) distributive – the salary level contributes to the redistribution of labor between industries, territories, enterprises;

4) accounting – salary allows you to evaluate the measure of participation of living labor in the formation of the price of the product;

5) social – salary allows you to implement the principle of social justice (equal pay for equal work).

In modern conditions, there are serious problems in wages: the minimum wage is much lower than the physiological subsistence minimum of a person;

excessively high differentiation of wage rates (the ratio reaches 1:30 or more); the amount of wages is poorly related to the qualifications of the employee and the quality of his work; there are delays in the payment of wages. All this reduces the stimulating, reproductive and social functions of remuneration.

The role of wages in the economy is not limited to the listed functions. Wages are of great importance in the formation of incomes of the population, determining the level and composition of consumer demand, when planning the state budget, when choosing a taxation system. Therefore, the regulation of wages is one of the main directions of the state economic policy.

6.4. STATIC EXPLANATION OF UNEMPLOYMENT. FORCED UNEMPLOYMENT AND REAL WAGE ADJUSTMENT. COLLECTIVE DISPUTES, SOCIAL MINIMUMS, INCENTIVE WAGES AND THE RIGIDITY OF REAL WAGES

One of the characteristic manifestations of macroeconomic instability is the existence of an army of unemployed.

Unemployment became a form of economic imbalance already in the first half of the XX century. In a certain sense, unemployment is a kind of payment that society is forced to bear for the resulting economic effect. The growing competition in the world encourages entrepreneurs to constantly look for ways to reduce the costs of the production factor "labor".

According to the definition of the International Labour Organization (ILO), an unemployed person is a person who does not work, is able to work (ready to start work) and has been actively looking for work for the last four weeks.

The labor force, or economically active population, consists of the employed and the unemployed.

Employed persons are persons over the age of 16 who are employed or self-employed, as well as those on vacation or temporarily unemployed due to illness.

There is also a category of persons who are not included in the workforce. In most Western countries, these include students of secondary schools and higher educational institutions, the army (if it is completed on the basis of compulsory conscription), housewives and those who do not want to work. In Russia, students and the army are included in the workforce.

Knowing the number of economically active population, the number of employed and unemployed, it is possible to determine what share of the total number of employed in the economy is occupied by the unemployed:

The country's labor force (L):

$$L = E + U,$$

where E – employed; U – unemployed.

The unemployment rate is calculated as the ratio of the number of unemployed (U) to the number of persons representing the labor force (L), expressed as a percentage: $u = (U / L) \cdot 100\ \%$.

Unemployment and its types

Full employment can also be observed in the presence of unemployment. This level of unemployment is called natural. The real volume of the national product produced at the natural unemployment rate is called the country's production potential. It is believed that this volume of production is produced with full use of resources.

The natural unemployment rate exists when the labor market is balanced, when the number of job seekers is equal to the number of available places. If there are no vacancies, we observe a shortage of aggregate demand and cyclical unemployment.

With excessive aggregate demand, when there is a shortage of labor, i.e. the number of available jobs exceeds the number of workers looking for work, the actual unemployment rate is below the natural level. As a rule, this situation is characterized by inflation. However, most often there is an excess of the actual unemployment rate over the natural one. The natural unemployment rate cannot be called a fixed value once and for all. So, in the 60s of the XX century. it was 4 %, currently it is in the range of 5–6 %.

To determine the unemployment rate, the unemployment rate indicator is used, defined as the ratio of the number of unemployed to the total workforce, expressed as a percentage.

Unemployment is a socio-economic phenomenon that indicates that a certain part of the able-bodied population does not find use for their mental and physical abilities due to reasons beyond their control. The unemployed, according to the decision of the International Labor Organization, include persons who have reached working age, who were out of work at the time of registration, but are ready to start work immediately and are looking for it.

Unemployment can take a variety of forms. It depends on the impact of the NTP, the uneven natural growth of the population and other factors. The following types of unemployment are distinguished: frictional, structural, cyclical.

Frictional unemployment occurs when employees either quit in order to find a more suitable place of work, in their opinion, or are looking for work because they are about to be fired, or their work is seasonal, etc. After a certain period of

time, they will either find it, or return to their old places. They will be replaced by others in the general fund of the unemployed for one reason or another.

With frictional unemployment, workers are looking for work or waiting for it in the near future. This type of unemployment is associated with the relatively slow response of the labor market to it and the existence of an imbalance between the number of workers and the number of jobs.

This type of unemployment is characterized by the desire of an employee to find a job that corresponds to his abilities and inclinations, thereby solving the problem of rational distribution of labor. A worker who improves his qualifications, professional level, seeks to move to a highly paid and more attractive job.

A worker who ceases to improve his professional skills over time becomes the object of the following type of unemployment – structural. *Structural unemployment* is associated with changes in the structure of consumer demand and production technology, which change the structure of the overall demand for labor, as a result of which the demand for some professions decreases, and for others, including those that did not exist before, increases. The slow response of the labor market is characterized by the discrepancy between the structure of the labor force and the structure of new jobs. Since some workers do not have the necessary skills and experience that a new production or service sector needs, they become unemployed due to changes in technology and the nature of consumer demand.

The differences between frictional and structural unemployment are sometimes difficult to determine. The essential difference is that workers classified as frictional unemployment have skills and experience that they can sell and that society needs. The "structural" unemployed need retraining, additional training, and a change of residence, which is associated with significant problems. Frictional unemployment is more short-term, while structural unemployment is more long-term and is considered more serious.

Taken together, frictional and structural unemployment represent the so-called ***natural unemployment rate***, or ***equilibrium unemployment rate***.

This level is often referred to as the ***"full employment level"***. The natural unemployment rate, as you know, determines the level of potential GDP.

The combination of the words "natural" and "unemployment" is less and less satisfied with economic scientists who study these complex processes. Therefore, in the modern economic literature, the term NAIRU (Non-Accelerating- Inflation Rate of Unemployment), i.e. the unemployment rate that does not accelerate inflation, can be found more and more often.

This name emphasizes the existence of a certain limit of the unemployment rate, beyond which the economy will face inflation. In other words, if the

government strives to reduce unemployment existing at the level of potential GDP (full employment of all resources), it will inevitably face inflation. The natural unemployment rate, or NAIRU, is defined as the average value of the actual unemployment rate in the country for the previous ten years and the next ten years, taking into account forecast estimates. It should be noted that any methods of calculating the natural unemployment rate have certain errors. So, in public opinion polls and surveys of the unemployed themselves, many people who, for one reason or another, do not actively try to look for a job, nevertheless indicate themselves in the "unemployed" column. Those who are actually employed in the shadow economy often call themselves unemployed.

Let's consider the reasons for the long-term sustainability of the natural unemployment rate.

Firstly, there is a developed unemployment insurance system. Benefit payments significantly reduce the incentives for rapid employment and increase the time that unemployed people spend looking for a new job.

Secondly, an important factor is the so-called rigidity of wages, which generates involuntary unemployment.

We already know that in the labor market, the balance between the supply and demand of labor is established under certain conditions (fig. 6.22).

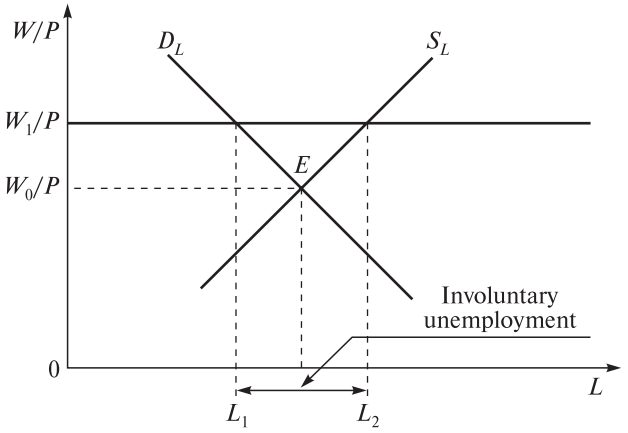

Fig. 6.22. Wage rigidity and forced unemployment

Forced unemployment occurs when the level of real wages exceeds its equilibrium value. The inflexibility of wages leads to a relative shortage of jobs. Many workers become unemployed because, at a given wage level, the supply of L_2 labor exceeds the demand of L_1 for it.

The labor market can be in such a frozen state of disequilibrium for quite a long time, which is determined by the following factors.

Firstly, by fixing the wage level in contracts with trade unions and in individual labor agreements.

Secondly, by legislative provisions of the minimum wage, below which entrepreneurs have no right to reduce it.

Thirdly, the behavior of firms that are not interested in reducing the level of wages, because these firms are afraid of losing a highly qualified workforce when it decreases.

It should be noted that the natural unemployment rate is not set once and for all. In many countries in the XX century there was a tendency to increase the natural unemployment rate in the long term, although in some periods it decreased. By the beginning of 1999, the United States had achieved an unprecedented high level of employment over the past 30 years: the actual unemployment rate was only 4.2 %. With an able-bodied population of 133 million people, 128 million people worked in the country, or every second citizen of the country. But there was no increase in the rate of inflation. It can be assumed with some caution that by the specified period there was a decrease in the natural unemployment rate. However, in 2001 the situation began to change. The actual unemployment rate in the United States was 5.6 % as of December 2001. According to the calculations of the National Bureau of Economic Research (NBER), the US economy has been in recession since March 2001. The rise, which began in March 1991, ended in March 2001. It lasted exactly 10 years and was the longest in the history of NBER's economic observations.

Cyclical unemployment occurs when the overall demand for labor in all industries, spheres and regions falls. It is caused by a downturn in the economy or insufficient aggregate spending. A decrease in aggregate demand for goods and services reduces employment and increases unemployment. During periods of business downturn, the unemployment rate exceeds its natural level. Then even the most conscientious workers with high qualifications may be temporarily dismissed. The duration of their average period of unemployment goes beyond the limits of the interval within which unemployment is considered frictional.

The difference between the actual value of the unemployment rate recorded in a given period of time and the value of the natural rate is called *cyclical unemployment*. During a downturn in economic activity, cyclical unemployment complements frictional and structural unemployment. During periods of rising business activity, cyclical unemployment disappears.

If the actual unemployment rate exceeds the natural and, then part of the economic potential is irretrievably lost:

$$u > u^* \Rightarrow Y < Y^*,\ Y - Y^* - \text{release gap.}$$

If the output gap is expressed as a percentage, then we get a lag in GDP:

$$\frac{Y - Y^*}{Y^*} \cdot 100\,\%.$$

The quantitative relationship between the lag in real GDP and the level of cyclical unemployment is reflected by the *Oaken Law*.

Oaken's law is usually written in the form of the following equation:

$$\frac{Y - Y^*}{Y^*} \cdot 100\,\% = \beta(u - u^*).$$

The left part is the lag in GDP. The expression enclosed in parentheses is the level of cyclical unemployment:

$$U = U^* + U_C,$$

$$U^* = U_f + U_S,$$

$$u = \frac{U_f + U_S + U_C}{L} \cdot 100\,\%,$$

$$u^* = \frac{U^*}{L} \cdot 100\,\%,$$

$$u_C = \frac{U_C}{L} \cdot 100\,\%,$$

$$u\mathrm{C} = u - u^*.$$

β – empirical coefficient of sensitivity of GDP to the level of cyclical unemployment, usually $2 \le \beta \le 3$.

The essence of Oaken's Law: if the actual unemployment rate exceeds the natural level by 1 percentage point, then the lag in GDP will be β percentage points.

Okun's law has another interpretation.

1. It is assumed that if the actual unemployment rate in the reporting period does not change compared to the previous year, then the *economic growth rate* (real GDP growth rate) will be 3 %:

$$\frac{Y_t - Y_{t-1}}{Y_{t-1}} \cdot 100\,\% = 3\,\%,$$

where Y_t – the actual level of real GDP in the reporting year; Y_{t-1} is the actual level of real GDP in the previous year.

2. Each percentage point increase in the actual unemployment rate reduces the rate of economic growth by 2 percentage points:

$$\frac{Y_t - Y_{t-1}}{Y_{t-1}} \cdot 100\,\% = 3\,\% - 2(u_t - u_{t-1}),$$

where u_t and u_{t-1} are the actual unemployment rate in the reporting and previous years, respectively.

The assessment of the labor market is incomplete without taking into account seasonal, hidden and technological unemployment. *Seasonal unemployment* is the result of seasonal types of work in certain industries: agriculture, construction, tourism, etc., where employment is provided only during certain seasons. *Hidden unemployment* occurs when using such a number of workers in production, which is not required at the moment for effective farming. Technological unemployment occurs when workers are replaced by machines that reduce the labor intensity of the material goods produced.

The growth of unemployment in post-socialist countries leads to the fact that the population begins to struggle not for an active lifestyle, not for the search for effective areas of employment, but for survival in conditions of preserving the traditions of paternalism and equalization. This further intensifies the recession in the economy and has the most negative effect on the motivation of labor and its productivity at both the micro and macroeconomic levels.

Unemployment in the mechanism of a market economy

In a self-regulating market economy, unemployment is an integral element of development. When achieving macroeconomic equilibrium for a short time, it can be combined with full employment.

Maintaining the equilibrium state of the economy implies an increase in national income, which is associated with an increase in output, inflation or a reduction in production and unemployment. Macroeconomic equilibrium is established as a result of fluctuations in national income around total expenditures until the moment of equality with them.

If the national income decreases and is fully consumed by society, and there are no savings, then total expenditures will remain unchanged. The lack of investment and consumption of the entire product produced is characterized by equilibrium. However, the unsatisfied demand for investments will be filled by economic agents at the expense of inventories. The growth of aggregate demand will begin to exceed national income, which will stimulate the expansion of production and cause an increase in national income until it aligns with total expenditures.

The opposite situation will occur if the national income exceeds the equilibrium state of the economy. Producers will experience difficulties with the sale of manufactured products, i.e. the total costs will be less than the national income. The mechanism of the market to achieve equilibrium will encourage economic agents to reduce production to the equilibrium of total expenditures with national income.

Suppose the national income is 1200 billion rubles, consumption is 1200 billion, demand for investment is 60 billion, total expenditures are 1260 billion rubles, there are no savings. If there were no investments, then households would consume the entire product produced and the economy would be in an equilibrium state. However, the unsatisfied demand for investments is realized through the use of inventories, which stimulate the expansion of production. This in turn leads to an increase in national income. In our example, this can continue until the national income is equal to 1800 billion rubles, consumption – 1740 billion, savings – 60 billion, total expenditures – 1800 billion rubles, therefore, national income has aligned with total expenditures and equilibrium has come in the economy. If we assume that there are free workers and unloaded production facilities, i.e. potential opportunities to increase aggregate demand, then this may lead to growth.

Full employment in macroeconomic equilibrium has its own characteristics. In our example, with national income equal to 2000 billion rubles, consumption will amount to 1920 billion, savings – 80 billion, investments – 60 billion, total expenditures – 1980 billion rubles. We see that national income exceeds total expenditures by 20 billion rubles. This situation in fig. 6.23 is characterized by the segment M_0M_E and is called the deflationary gap.

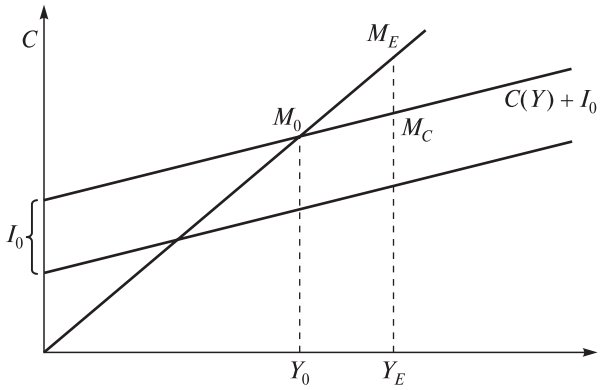

Fig. 6.23. Consumption function

The considered example and analysis of fig. 6.23 and 6.24 show that the level of full employment depends more on a certain level of production rather than on the level of wages.: $Y_0 = N_0$. It follows from them that full employment is possible only at the level of production Y_E, and the balance of goods and services – at the level of production Y_0. Thus, achieving full employment implies a shortage of goods and services.

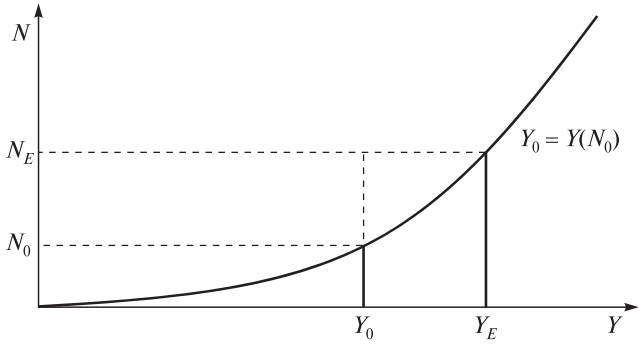

Fig. 6.24. Production function

Therefore, society is always faced with a choice: to accept unemployment (in fig. 6.24, this is the N_0N_E segment) or to provide full employment when the demand for goods and services exceeds (in fig. 6.23, this is the M_0M_E segment). The objective mechanism of the market is not able to combine the level of equilibrium of goods and services with the level of full employment. In this regard, an external effect is needed that contributes to the resolution of the conflict in the market of goods and services and the labor market. The state can act as such a stabilizing factor.

Full employment is set at $Y_0 = Y(N_0)$. Figure 6.24. shows that in the market of goods and services, production reaches equilibrium at the level Y_0, defined as $Y_0 = C(Y_0) + 1$. Then equilibrium is possible if:

– $Y_0 < Y_E$ — underemployment or unemployment;

– $Y_0 = Y_E$ — full employment;

– $Y_0 > Y_E$ — exceeding the level of full employment or lack of labor force.

In the economy, full employment can be observed when the level of production coincides with the demand for goods and services, allowing everyone to find a job. A situation where $Y_0 > Y_E$ characterizes an imbalance, but it can be stabilized, hoping for an increase in wages until full employment is achieved. The situation $Y_0 < Y_E$ is the most difficult, since trade unions can prevent the reduction of wages before employment is established. A possible

way to ensure full employment is to stimulate the production of Y_0 using the multiplier effect or fiscal policy to increase to the level of Y_E . Achieving equilibrium at full employment using the multiplier effect, investment and economic stimulation is impossible without the participation of the state.

The problem of poverty due to the inability to receive wages goes beyond the economic equilibrium and becomes a problem of social or political equilibrium. Unemployment can be tolerable if the unemployed are paid benefits that provide them with a certain subsistence minimum. It does not matter to the state whether to pay unemployment benefits or invest the same amount in the economy in the form of government spending on the construction of enterprises, roads, airfields, etc. To overcome poverty in unemployment, such measures as paying benefits to the unemployed, offering them jobs, and providing long-term loans to enterprises at low interest rates are equally effective. All these measures are reduced to the distribution of money in the economy or directly among the unemployed.

The existing optimal proportions between taxes and the level of production are a stabilizing factor in the economy. If, with full employment, there is a tendency to depression and a decrease in the level of budget revenues, then the state increases its expenses by distributing benefits to the unemployed. In this case, an additional state budget deficit is automatically created, which will contribute to full employment in the future. However, this is typical for the short-term period. At the same time, the state cannot indefinitely increase the budget deficit. These measures, although they have an effect in the short term, do not provide it for a long period. The payment of unemployment benefits does not increase the future production potential, while encouraging the creation of new factories increases the potential of the nation in the future.

6.5. DYNAMIC EXPLANATION OF UNEMPLOYMENT. SUSTAINABLE LABOR MARKET CONDITIONS AND TRANSITION PROCESSES. STOCKS, FLOWS AND FRICTIONAL UNEMPLOYMENT. JOB SEARCH AND DURATION OF UNEMPLOYMENT

The term “natural unemployment” was introduced by M. Friedman (for whom, as is known, it is not unemployment that is the main macroeconomic problem and criterion of macroeconomic instability, but inflation) to characterize the unemployment rate in conditions of long-term equilibrium.

For Friedman, ***the natural rate of unemployment*** (NRU) is a level that reflects the real structure of the goods and labor markets, with all their imperfections, stochastic fluctuations in supply and demand, the cost of collecting information about vacant jobs and their availability, etc.

Thus, natural unemployment has actually absorbed what was previously called frictional and structural unemployment.

The natural unemployment rate depends on many factors.

1. From the level of the minimum wage. The higher it is, the higher the natural unemployment rate.

2. On the amount of unemployment benefits. The higher it is, the higher the natural unemployment rate.

3. From the development of the trade union movement. The larger it is, the higher the natural unemployment rate.

4. From work motivation. The higher it is, the lower the natural unemployment.

According to M. Friedman's hypothesis of the natural unemployment rate.

1. This is the unemployment rate corresponding to the stable state of the economy, the level to which its actual level tends in the long term.

2. This is the unemployment rate at which inflation expectations are compatible with the current rate of inflation, i.e. it is ***the unemployment rate corresponding to long-term equilibrium***.

This interpretation of the natural unemployment rate formed the basis of the "labor dynamics model" developed by M. Friedman (a dynamic model of a stable unemployment rate).

Since in a stable state (in a state of long-term equilibrium), the number of employed who have lost their jobs and become unemployed is equal to the number of unemployed who have found work and become employed, insofar as in a stable state:

$$sE = fU,$$

$$E = L - U,$$

$$s(L - U) = fU \text{ or } sL - sU = fU,$$

where s – the share of employed who lost their jobs (of the total number of employed), per month; f – is the percentage of unemployed who have found a job (out of the total number of unemployed), per month.

Then

$$fU + sU = sL \text{ or } U(s + f) = sL.$$

Dividing both parts of the equation by L, we get

$$\frac{U}{L} = (s + f) = s.$$

But $\frac{U}{L} = u$, which means $u = \frac{s}{s + f}(100\,\%)$.

Recall that the prerequisite of the model is a stable state, i.e. a state of long-term equilibrium, in which the actual unemployment rate is the natural level, therefore the stable unemployment rate $u = u^*$.

The values of s and f are calculated as follows:

$s = 1$ / the average period of a person's stay among the employed (in months);

$f = 1$ / the average period of a person's stay among the unemployed (in months).

If the size of the labor force L and the values of the coefficients s and f are known, then the model allows you to calculate the number of employed and the number of unemployed in the economy.

The attempt to link the definition of the unemployment rate with inflation is characteristic of the concept of ***Non Accelerating Inflation Rate of Unemployment*** (NAIRU) – the unemployment rate that does not accelerate inflation: this is the unemployment rate corresponding to the constant rate of inflation; it not only does not accelerate, but also does not slow down inflation. (This term was first used by James Tobin in 1980 in the article "Stabilization Policy ten years later").

The hypothesis of the natural unemployment rate assumes that:

1) fluctuations in aggregate demand affect only the current levels of output and employment;

2) in the long term, the economy is described by the classical model {the natural unemployment rate and the potential output level, which short-term fluctuations in aggregate demand cannot have any effect on).

Some economists question the hypothesis of the natural unemployment rate:

– fluctuations in aggregate demand can affect both the volume of GDP and the unemployment rate in the long term;

– they point to the mechanisms by which a recession can cause irreparable damage to the economy in the long term, affecting the natural unemployment rate.

One of these mechanisms is hysteresis, a term used to describe the long-term effect of past events on the natural unemployment rate (fig. 6.25).

But: if there is a hysteresis, then *AS* shifts to the left and, consequently, the potential output decreases and

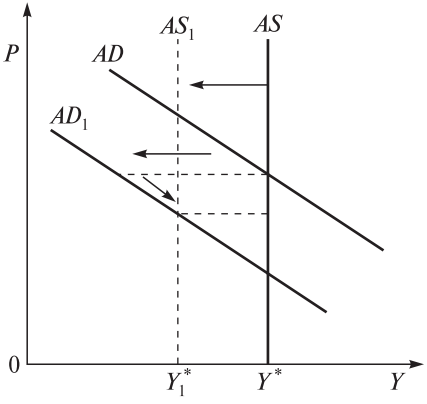

Fig. 6.25. Hysteresis

the natural unemployment rate increases: $Y_1^* < Y^* \Rightarrow u^* \rightarrow$. This situation can be interpreted differently: hysteresis leads to a reduction in the total labor force, and hence to a reduction in economic potential.

1. The recession causes a change in the personal characteristics of people who have become unemployed (loss of valuable skills ⇒ change in attitude to work ⇒ decrease in the desire to get a job ⇒ increase in frictional unemployment ⇒ increase in the natural unemployment rate).

2. Another long-term effect of the economic downturn is to change the process of setting wages: people who have become unemployed may lose influence on the process of determining the amount of wages (as they may lose the status of a trade union member).

It should be noted that hysteresis is a controversial point. However, the following is important: a recession can be very expensive for society, more expensive than it seems in the light of the hypothesis of the natural level.

The main conclusion is that an economic downturn can have not only short-term, but also serious long-term consequences (the shift of the aggregate supply curve to the left in fig. 6.25).

In fairness, we also note the factors that lower the natural unemployment rate:

1) economic policy measures affecting the aggregate supply of *AS*. Goal: to increase the economic potential of Y^*, i.e. to shift the *AS* curve to the right:

– professional retraining programs (to reduce structural unemployment).

– programs that ensure labor mobility (to reduce structural unemployment) as part of regional policy;

2) a set of measures to reduce inflation expectations: reduction of inflation expectations ⇒ reduction of unemployment (Phillips curve).

Unemployment can be viewed in terms of stock and flow.

Stock – the number of unemployed *U* at a given time.

The flow is a characteristic of the dynamics of the unemployed, movement in and out of the state of unemployment.

The flow indicators are the inflow into unemployment and the outflow from unemployment.

The influx into unemployment (*I*) is the number of people who have gone into a state of unemployment.

Outflow from unemployment (*O*) is the number of people who have come out of unemployment.

There are six main flows that determine the state of the labor market and the unemployment rate (fig. 6.26): from the employed to the unemployed and vice versa, from the economically inactive to the employed and vice versa, from the unemployed to the economically inactive and vice versa.

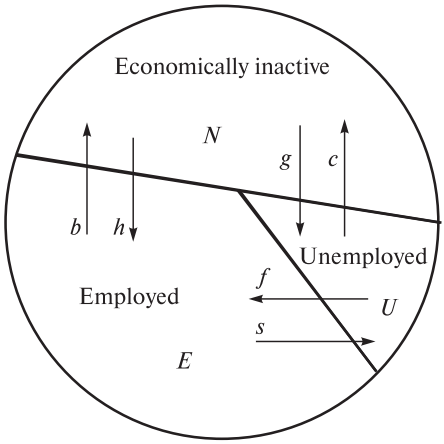

Fig. 6.26. Labor market flows

Let's denote these flows:

– *Rep*(*b*) – the share of employees who leave the labor force;

– *Phe*(*h*) – the proportion of those who move from the economically inactive population to the employed;

– *Pun*(*c*) – the percentage of unemployed who leave the labor force;

– *Fir*(*g*) – the proportion of those who move from the economically inactive population to the unemployed;

– *Rei*(*s*) – the proportion of those who lose their jobs and become unemployed;

– *Rie*(*f*) – the percentage of unemployed who find work.

The unemployment rate is a function of these six flows:

$$u = f(\overset{+}{b},\ \overset{-}{h},\ \overset{+}{c},\ \overset{-}{g},\ \overset{+}{s},\ \overset{-}{f}),$$

where the sign above the variable means its direct or inverse relationship with the unemployment rate.

By accepting the prerequisites of a constant level of economically active population and a constant level of unemployment, it is possible to find a specific type of this function.

With a constant level of the economically active population and an unchanged population, the inflow into the economically active population and the outflow from it are equal: unemployment frictional vacancy inflation

$$(h + g)N = b(LU) + cU.$$

For a constant unemployment rate, the inflow into it is equal to the outflow from it:

$$I = O(LU) + gNO = fU + cU.$$

From these relations we obtain

$$u = \frac{U}{L} = \frac{1}{1 + \dfrac{(f + c)h + gf}{(h + g)s + gb}}.$$

If we add to the accepted premise that the labor market is constant, there is no outflow from the labor force and there is no inflow from the economically inactive population, then the inflow and outflow from unemployment will be:

$$I = s(LU),$$

$$O = fU.$$

With an unchanged unemployment rate of 1 = 0

$$u = \frac{U}{L} = \frac{s}{s + f}.$$

An important characteristic of unemployment is also the duration of unemployment d – the duration of the period during which the employee is unemployed.

The number of unemployed U (stock) can be represented as: $U = I \cdot d$ at d, equal to the average duration of unemployment.

The statement $u = i \cdot d$ in a permanent labor market model is a simplification that holds true when the labor market is in a steady state ($i = I / L$).

If the unemployment rate does not change, if $o = O / U$ is the level of exit from unemployment, then $u = i / o$.

In the classification of unemployment, involuntary and voluntary unemployment (or unemployment expectations) are distinguished.

Forced unemployment occurs when an employee can and wants to work at a given wage level, but cannot find a job.

Voluntary unemployment occurs when an employee could find a job, but prefers to remain unemployed, continuing to search for a better-paid or more desirable job than he is offered.

Depending on the economic causes that generate unemployment, it is divided into four types: frictional, structural, cyclical and seasonal.

Frictional unemployment occurs when workers move from one place of work to another. It is a consequence of short-term changes in the labor market and exists because the process of selecting employees and jobs is not instantaneous.

Structural unemployment occurs during long-term changes in the structure of the economy, which lead to a discrepancy between the existing qualifications or profession of the employee and the qualification or professional requirements of the workplace. Territorial structural inconsistencies may also arise.

Cyclical, or demand-deficient, unemployment occurs when there is insufficient aggregate demand.

Seasonal unemployment is caused by fluctuations in the level of economic activity during the year, characteristic of some sectors of the economy.

Hidden unemployment consists of people who are not part of the economically active population at a given time, but would like to enter the labor force if the job provided to them is suitable for them.

Hidden unemployment is a situation when employees, without formally breaking off employment relations and being considered employed, do not have a job and do not receive wages or work part-time (day, week). In international practice, this situation is called underemployment.

Frictional unemployment is associated with the process of finding a job by an employee. Since the information on the labor market is imperfect, the process of finding an acceptable job takes time.

The main approaches to the analysis of the process and duration of job search are contained in the theory of search in the labor market.

A simple job search model contains the following prerequisites:

– imperfection of information in the labor market;

– jobs differ only in the wage rate;

– the employee knows the distribution of the proposed salary, but it is not known which company will offer what level of salary;

– if an employee has found a vacant workplace, it will be offered to him;

– the employee has no restrictions in funds, he can continue the search as long as he sees fit;

– an employee receives only one job offer in one period;

– the search process is associated with direct and alternative costs.

Figure 6.27 shows the curve of the probable distribution of the proposed salary. If the employee knew which company would offer the maximum salary (w_{max}), he could immediately get a job in this company, in the absence of such information, the employee is forced to resort to the search process, offering his work to firms with vacancies, on the principle of random sampling, comparing the proposed salary levels and choosing an acceptable one for him.

An employee can limit the search field by either choosing the highest salary from a deliberately limited number of job offers, or by setting a minimum acceptable reserve salary for himself and agreeing to an offer of equal or higher wages.

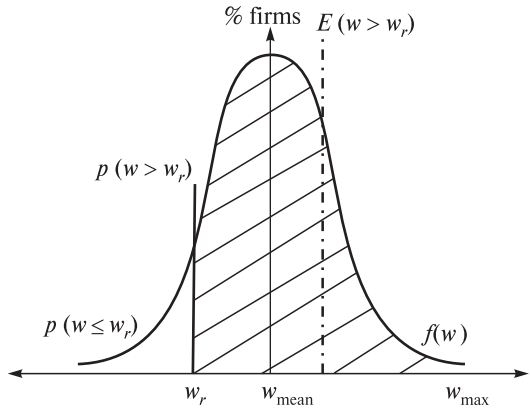

Fig. 6.27. Distribution of the proposed salary

In the first case, with a "fixed sample" (fig. 6.28), the employee conducts an inconsistent search, determines the optimal number of salary offers for a given period n^* and selects the highest salary from the proposed ones. As the number of firms n to which an employee has applied grows, so do the costs of finding a job C_n, and the expected return on the search changes $E(\max w/n)$. The ratio between marginal costs and marginal benefits from the search determines the optimal size of the n^* sample for the search. On the graph, the optimal sample size is determined by the point e where the expected benefits curve and the line parallel to the search cost curve touch. Not all firms will be included in the sample, since the search costs increase with increasing n, and the marginal return from the search in the form of higher salary offers begins to decrease.

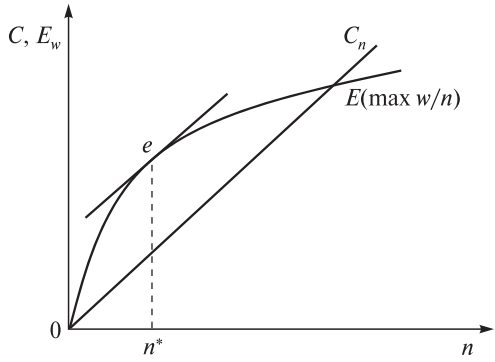

Fig. 6.28. The "fixed sample" job search model

In the second case, based on the concept of reserve wages, the individual performs a sequential search until he meets a salary offer that exceeds the minimum wage acceptable to him, called the reserve wage w_r. Thus, in this case, the job search task is transformed into the task of determining such a reserve salary so that the return on the search R_w, i.e. the difference between the expected salary E_w and the costs C, is maximal.

The costs will depend on the duration of the search, determined by the size of the reserve salary. If $p(w_r)$ is the probability of receiving a job offer with a salary $w \geq w_r$, then the search duration will be equal to: $D^* = 1 / p(w_r)$, and the total search costs will be CD^*.

Then the return on the job search will be:

$$R_w = E_w - C / p(w_r), \text{ when } w \geq w_r.$$

The maximization of R_w depending on the size of the reserve salary is illustrated in fig. 6.29.

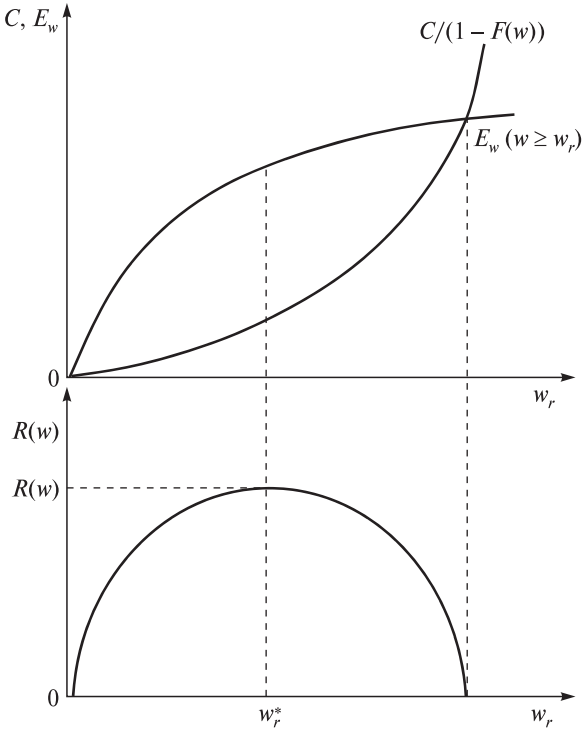

Fig. 6.29. Job search model with a reserve salary

This value is equal to the shaded area in fig. 6.27 (the total area under the distribution curve is one).

The expected search costs, taking into account the unemployment benefit paid B_U and the expected duration of the search, are equal:

$$(C - B_U) / p(w_r) = (C - B_U)D^*.$$

If the expected marginal return is represented as a decreasing function of the reserve salary $A(w_r)$, then the marginal costs will also be a function of the reserve salary:

$$(C - B_U) = A(w_r).$$

This dependence is shown in fig. 6.30. An increase in unemployment benefits from B_U to B'_U increases the reserve salary from w_r to w'_r and, consequently, increases the duration of the search. The unemployment benefit reduces the net search costs and thereby increases the optimal duration of the search. There may be a critical level of this benefit (or other similar welfare support benefits) at which the job search becomes unprofitable – the individual maximizes the expected income during life, living on benefits.

If the average value of the salary distribution for a job seeker increases (for example, due to vocational training), while the variance relative to this average value remains unchanged, then the curve $A(w_r)$, reflecting the function of the marginal expected return, will shift to the right (as shown in fig. 6.30 of the curve $A(w'_r)$, increasing the reserve salary and the duration of the job search.

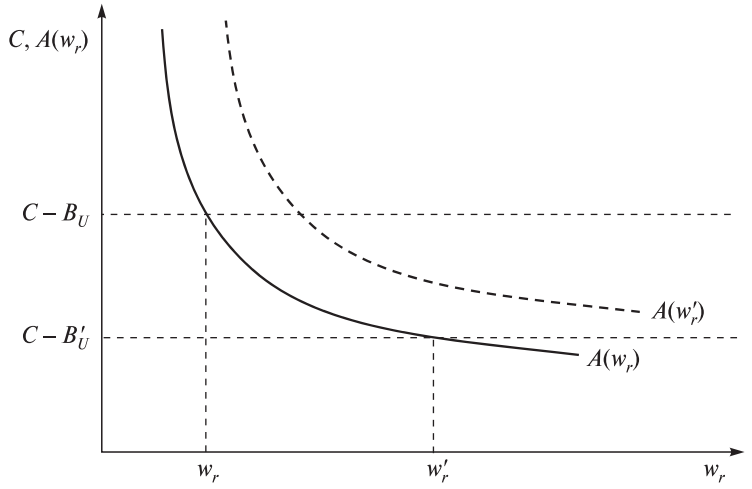

Fig. 6.30. Determination of the reserve salary

The ratio between the size of unemployment and vacancies existing in the economy allows us to analyze the structural component of unemployment. The output of the curve reflecting the relationship between vacancies and unemployment is based on the dependencies between excessive demand for labor $Z = (D_L\ S_L)/S_L$, on the one hand, unemployment U, vacancies V, on the other.

The relationship between unemployment and excess demand for labor is reversed (fig. 6.31, quadrant I), since unemployment increases with an excess supply of labor, and is nonlinear due to frictional unemployment that exists at any level of labor demand.

The relationship between vacancies and excessive demand for labor is direct and linear (fig. 6.3, quadrant IV).

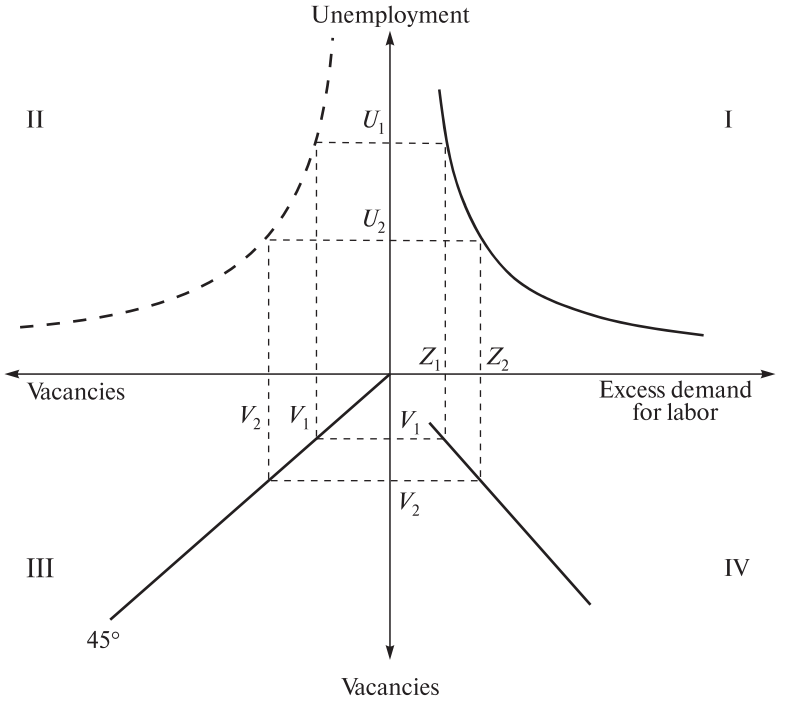

Fig. 6.31. Output of the vacancy–unemployment dependence curve

Unemployment U_1 corresponds to excessive demand for labor Z_1, which corresponds to vacancies V_1, unemployment U_2 corresponds to Z_2, V_2. In the

quadrant II, fig. 6.31 shows the dependence of vacancy-unemployment *UV* (called the Beveridge curve), it has an inverse nonlinear character also due to frictional unemployment, which does not allow vacancies or unemployment to take a zero value.

Changes in aggregate demand are expressed in the movement of the labor market along the *UV* curve, if demand increases, then movement occurs to the left from point *A* to point *B* (fig. 6.32), if demand decreases, then to the right from point *A* to point *C*. If, as a result of changes in the labor market, there is an impact on structural unemployment (for example, a decrease in the time lag of adjusting supply and demand to qualitative changes in each other) or on frictional (increasing the efficiency of labor market information), then the *UV* curve shifts to the left to the *UV'* curve, because when an unemployed person finds a job, a single reduction of both the number of unemployed and the number of vacancies. Accordingly, any factors that increase frictional and/or structural unemployment shift the *UV* curve to the right to the *UV''* curve.

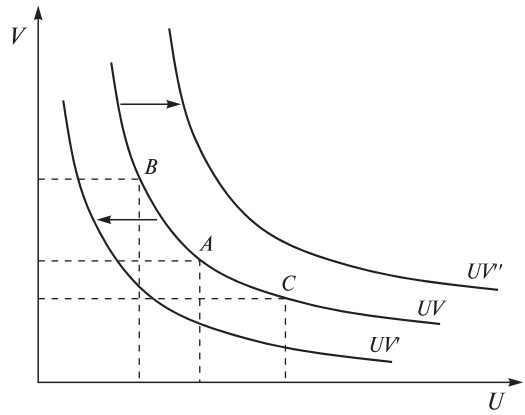

Fig. 6.32. The dependence of the vacancy – unemployment

If *j* is an employee's activity in job search, *mm* is a characteristic of structural correspondence between employees and workplaces (the smaller it is, the more employees and workplaces correspond to each other), then the probability of finding a job (*f*) can be represented as a function of employee activity, employer actions (number of vacancies), characteristics of structural correspondences: $f = f(j, V, mm)$. Then

$$u = \frac{s}{s + f(j, V, mm)}.$$

Increasing s (the probability of losing a job) and *mm* shifts the *UV* curve to the right, and increasing j shifts the *UV* curve to the left.

Demand-deficient, or cyclical, unemployment occurs when there is insufficient aggregate demand, and, consequently, insufficient demand for labor. Demand-deficient unemployment is sometimes also called Keynesian.

In classical models of the labor market, firms can sell the entire manufactured product, they do not face such a phenomenon as a shortage of aggregate demand for their product. The reason for this is the flexibility of prices; prices decrease in conditions of shortage of demand and rise in conditions of excess demand, thus maintaining the level of aggregate demand corresponding to full employment. However, if prices do not adjust, the volume of product that firms can sell is determined by the level of aggregate demand.

Let's assume that prices are fixed, and the level of aggregate demand is equal to AD_1 in fig. 6.33, *b*. This corresponds to the product release level Q_1. The maximum number of workers required for the production of Q_1 corresponds to L_1, as shown in fig. 6.33, *a*. If wages exceed W_1/P_1, employment is determined by the points of the demand curve, and accordingly unemployment (S_L–D_L) represents classical unemployment. With real wages below W_1/P_1, but above or equal to W_0/P_1, L_1 workers are employed, and the level of employment is determined by the restriction Q_1. The segment (S_L–D_{LE}) below W_1/P, but above W_0/P_1, defines unemployment, which is Keynesian in nature, since it arises from a shortage of aggregate demand. If real wages are lower than W_0/P_1, then employment is determined by points on the supply curve, since there is excessive demand in both the labor market and the goods market.

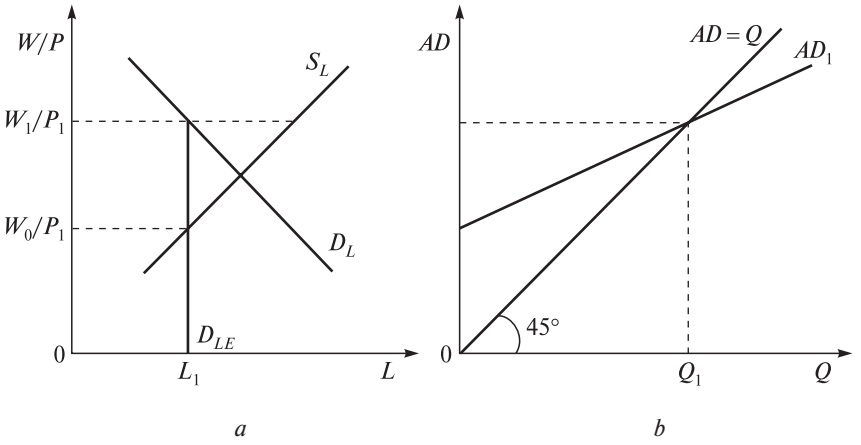

Fig. 6.33. Labor market (*a*) with limited aggregate demand (*b*)

It follows from this that firms cannot sell a product exceeding the quantity Q_1 which is determined by the level of aggregate demand. The product produced by additional workers beyond the L_1 limit has no value, i.e. the effective marginal product of labor beyond the L_1 limit is zero. The effective labor demand curve is shown by the D_{LE} line. If we now define the equilibrium as the intersection point of S_L and D_{LE}, there will be no unemployment. The decline in real wages has led to the fact that workers refuse to offer their services in the labor market, so a new equilibrium is established at the level of L_1 and W_0/P_1. As soon as wages exceed W_0/P_1, unemployment occurs, and with fixed prices as a prerequisite for this model, there is no reason to prefer W_0/P_1 to any other point. Nominal wages can be set at any point between W_0 and W_1, including the level of competitive equilibrium, but any level other than W_0/P_1 will be associated with involuntary unemployment. This simple model shows that if the effective level of aggregate demand does not meet the requirements of the market, then the market does not level out and unemployment occurs.

Figure 6.34 shows the product market in the upper right quadrant, showing the quantity of product Q corresponding to the demand for it for each price level P, and the quantity of product that the firm would like to sell at each price level. These are, respectively, the curves of aggregate supply and demand. The labor market is depicted in the lower left quadrant, where the labor demand curve has the usual form with a negative slope, and the labor supply curve is shown completely inelastic (which corresponds to a short-term period). The labor and product markets are linked by the production function depicted in the lower right quadrant and reflecting the decreasing marginal productivity of labor. In the upper left quadrant, a curve is shown that characterizes the nominal wage rate and is the result of the interaction of the price level and real wages $W^* = W/P \cdot P$.

In a state of competitive, classical equilibrium, all markets are balanced, as shown by the line connecting the points Q^*, P^*, L^* and W^*/P^*. Such a state requires full flexibility of both prices and wages.

In the case of Keynesian unemployment, an increase in prices to the P_1 level causes a decrease in real wages, an increase in demand for labor to the L_1 level and an increase in the amount of product that the firm is ready to produce at new prices to Q_1. However, at the same time, an increase in prices to the P_1 level reduces the demand for the firm's product to the Q level, in accordance with this, the demand for labor decreases to the L level and unemployment occurs, the size of which is determined by the size of the segment ($L \cdot L$). The marginal effective product of labor exceeding the level L is 0. The Keynesian "equilibrium" is shown in the figure by a rectangle, the sides of which are represented by a solid line.

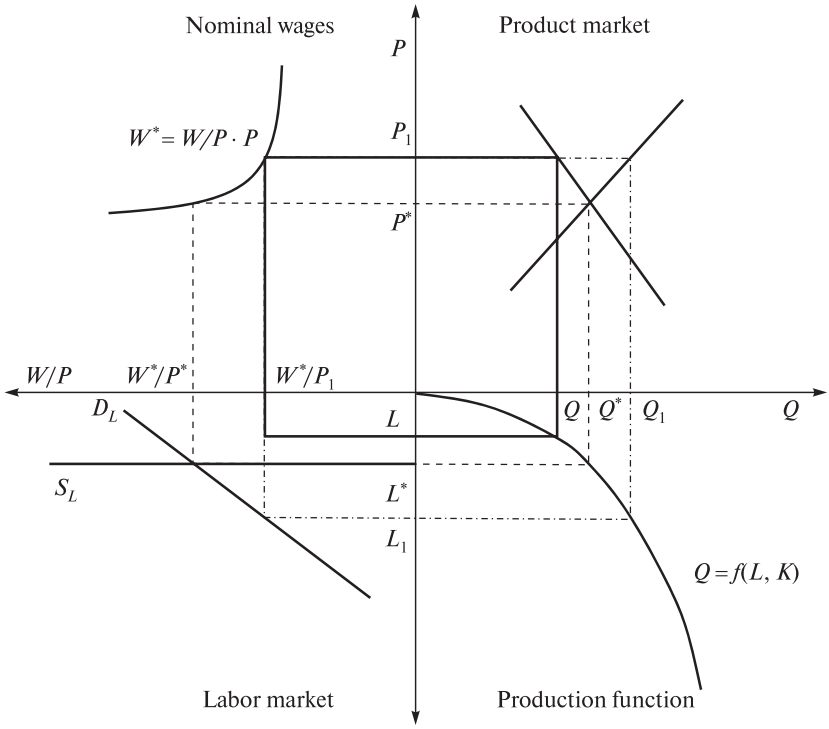

Fig. 6.34. Keynesian unemployment

For the formation of demand-deficient unemployment, the rigidity of wages is important – the inability of wages to change in response to changes in the demand for labor and, thus, to ensure the adjustment of the labor market. The causes of wage rigidity are considered in various models: effective wages, implicit contracts, the behavior of trade unions (the insider-outsider model), the oligopsonistic structure of the labor market.

6.6. THE FUNCTION OF AGGREGATE SUPPLY

The aggregate supply function expresses the dependence of the volume of the aggregate supply of goods on its determining factors. Since in a short period with a given technology, the volume of output depends on the amount of labor used in production, the factors determining the level of employment determine the volume of aggregate supply.

According to the ***neoclassical concept***, the aggregate supply function is increasing from the interest rate (fig. 6.35).

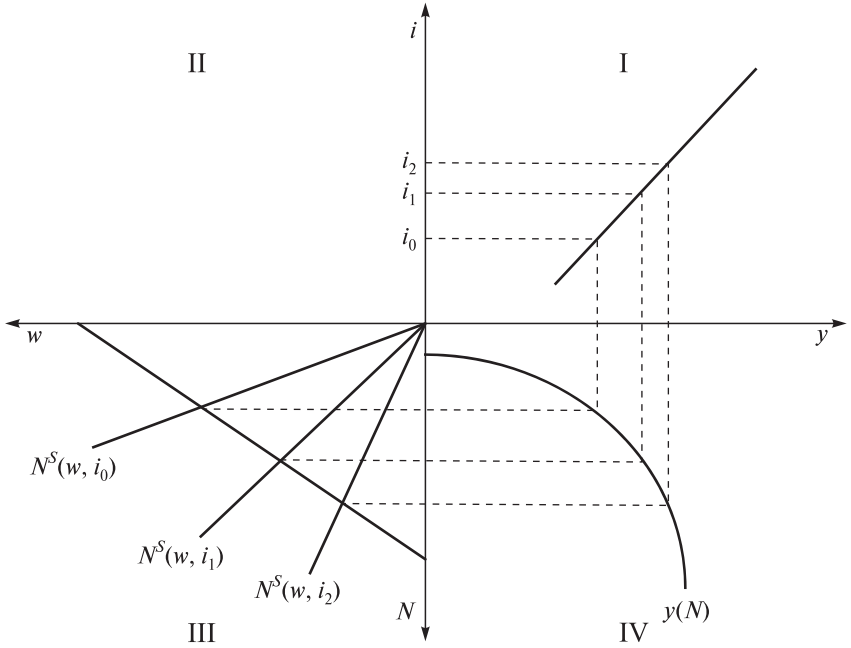

Fig. 6.35. Construction of the neoclassical aggregate supply function

For a given technology, represented by the production function $y(N)$ in quadrant IV, the demand of entrepreneurs for labor is given by the graph of the function $N^D(w) = dy/dN$, shown in quadrant III. The labor supply in the neoclassical concept is a function of two variables: $N^S = N^S(w, i)$. Therefore, each interest rate in quadrant III corresponds to its own labor supply curve. The interest rate is determined on the capital market in the process of equalizing the volume of savings and investments. With the real wage rate w_0 and the interest rate i_0, employment will be set at N_0 and the volume of total supply will be y_0. An increase in the interest rate ($i_0 \to i_1 \to i_2$) turns the N^S curve counterclockwise, since more labor will be offered at each real wage rate. This will lead to an increase in employment and an increase in the supply of goods.

According to the ***Keynesian concept***, the aggregate supply function expresses the relationship between the price level and the volume of goods supply: $y^S = y^S(P)$.

The dependence of the volume of production of goods on the price level cannot be interpreted as an aggregated microeconomic function of the supply of goods at a price, since the price level is not reduced to the average price of the aggregated good. The impact of changes in the price level on the supply of goods consists of two successive impulses created by the employment effect and the production effect.

The effect of employment

The level of employment (the amount of labor used in production) is determined as a result of equalizing the price of demand for labor with the price of its supply. The upper limit of the demand price is equal to the value of the marginal product of labor: $WD = Py_N$, where y_N is the marginal productivity of labor. The price of labor supply depends on the amount of labor offered and the reaction of its sellers to changes in the price level. Figure 6.36 shows the labor supply curve depending on the nominal wage rate.

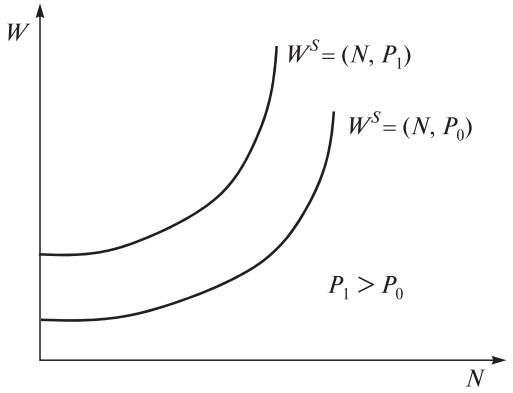

Fig. 6.36. Labor supply price curve

When, with an increase in the price level, any amount of labor is offered at the same price (the graph of the labor supply function gets on the spot), it is said that workers are subject to monetary illusions. If, in response to an increase in the price level, the supply price of each portion of labor also increases (the W^S graph shifts upwards), then workers are free from monetary illusions. At the same time, it should be borne in mind that the growth rate of the labor supply price may not equal the growth rate of the price level. In general, the labor supply price is represented by the function $W^S = W^S(N, P)$.

Therefore, in the Keynesian concept, maximum employment is determined from equality: $W^S(N, P) = Py_N$. To display the impact of changes in the price level on employment, we write down its full differential:

$$W_P^S dP + W_N^S dN = y_N dP + P dy_N, \tag{6.1}$$

where $W_P^S \equiv \frac{\partial W^S}{\partial P}$; $W_N^S dN \equiv \frac{\partial W^S}{\partial N}$.

Taking into account that

$$dy_N = \frac{dy_N}{dN} dN = \frac{d^2 y}{dN^2} dN \equiv y_{NN} dN,$$

equality (6.1) can be written as

$$\left(W_N^S - Py_{NN}\right) dN = \left(y_N - W_P^S\right) dP.$$

Then

$$dN = \frac{y_N - W_P^S}{W_N^S - Py_{NN}} \cdot dP. \tag{6.2}$$

Equality (6.2) reflects the effect of employment when the price level changes. It shows how much employment will change when the price level changes.

The effect of production

The size of the increase in production due to the increment of employment depends on the technology represented by the production function $y = y(N)$, hence $dy = y_N dN$. Taking into account the expression (6.2), we obtain

$$dy = y_N \frac{y_N - W_P^S}{W_N^S - Py_{NN}} \cdot dP.$$

Example. The labor supply is displayed by the function $N^S = 2W - 20$ when households are exposed to monetary illusions, and by the function $N^S = 2W - 20P$ when labor sellers react to changes in the price level. The labor supply price in the first case is determined by the formula $W^S = 0.5N + 10$, and in the second — $W^S = 0.5\ N + 10P$. Production is carried out according to the technology represented by the production function $y = 82N - 20N^2$; therefore, the price of demand for labor is determined by the formula $W^D = 82P - 2PN$. In the initial state $P = 1$ and employment is from the equality $0.5N + 10 = 82 - 4N$. $N = 16$; then $y = 82 \cdot 16 - 2 \cdot 16^2 = 800$.

Let the price level rise to $P = 1.375$; then, in the presence of monetar y illusions, $0.5N + 10 = 112.75 - 5.5N$, $N = 17.125$ and $y = 82 \cdot 17.125 - 2 \cdot 17.125^2 = 817.72$, and in their absence — $0.5N + 13.75 = 112.75 - 5.5N \cdot N = 16.5$ and $y = 82 \cdot 16.5 - 2 \cdot 16{,}5^2 = 808{,}5$.

Thus, in the presence of monetary illusions, the employment effect is 17.125 – 16 = 1.125, and the production effect is 817.72 – 800 = 17.72; in the absence of monetary illusions, respectively, 16.5 – 16 = 0.5 and 808.5 – 800 = 8.5.

The employment effect, followed by the production effect, can be zero or even negative. It all depends on the reaction of workers to an increase in the price level. The reason for the discrepancy between the growth rates of the price level and the nominal wage rate may be an erroneous forecast of the future price level by employees. If $W^D = P(82 - 4N)$, and $W^S = P^e(10 + 0.5N)$, where P^e is the price level expected by workers, then $N = (82P - 10P^e) / (0.5P^e + 4P)$. At $P^e = P$, the change in the price level does not affect employment; at $P^e < P$, it increases, and at $P^e > P$ it decreases. Three possible variants of the employment effect are shown in fig. 6.37.

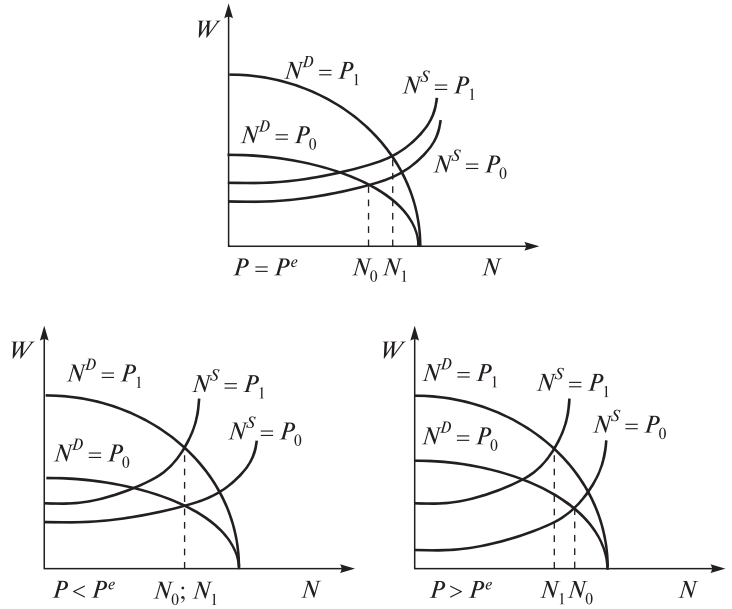

Fig. 6.37. Three variants of the employment effect with an increase in the price level

The effects of employment and production underlie the function of aggregate supply in the market of goods. Its graphical construction is shown in fig. 6.38.

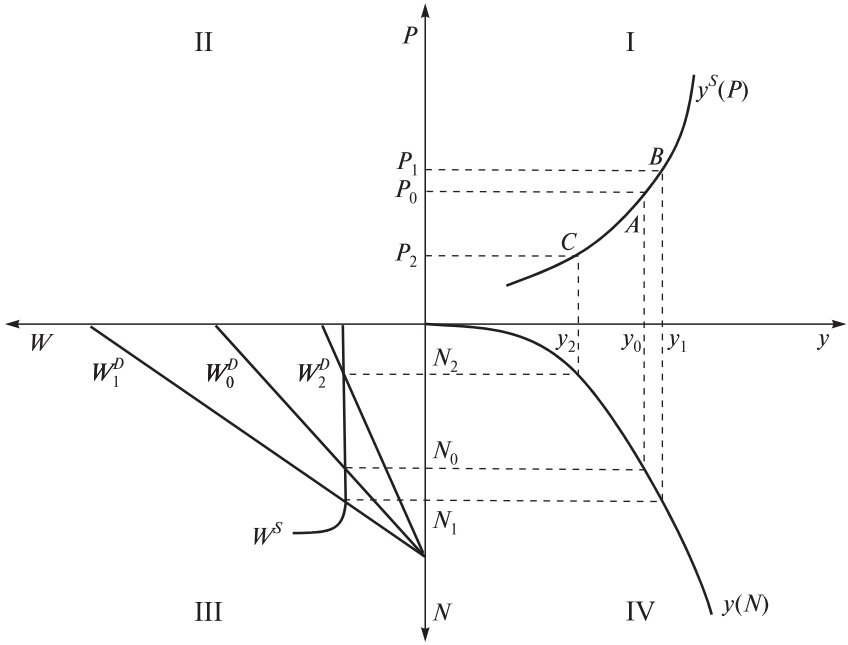

Fig. 6.38. Construction of the aggregate supply curve in the presence of monetary illusions

Quadrant III shows the labor market. Quadrant IV shows the graph of the production function. In the initial state, at the price level P_0, an equilibrium was established in the pile market with the nominal salary rate W_0 and employment N_0. It follows that with the existing technology, the volume of goods on the market is equal to y_0. Thus, at P_0, the volume of the offer is equal to y_0 and point A belongs to the graph of the aggregate offer function. When the price level rises to P_1, the labor market shifts $N_0^P \to N_1^P$. If households in the labor market are subject to monetary illusions, then the W_S curve will remain in place. Then employment will increase to N_1 and the volume of supply will increase to y_1. Therefore, point B also belongs to the graph $y^S(P)$. With a decrease in the price level to P_2, the demand for labor will decrease, which will be expressed by a shift $W_0^D \to W_2^D$, and employment will decrease to N_2, and the supply of

goods will decrease to y_2 (point C). By connecting all the points thus obtained in the quadrant I, we obtain a graph of the aggregate supply function $y^S(P)$.

The construction of this graph for the case when the supply pile reacts to a change in the price level is carried out similarly and is shown in fig. 6.39.

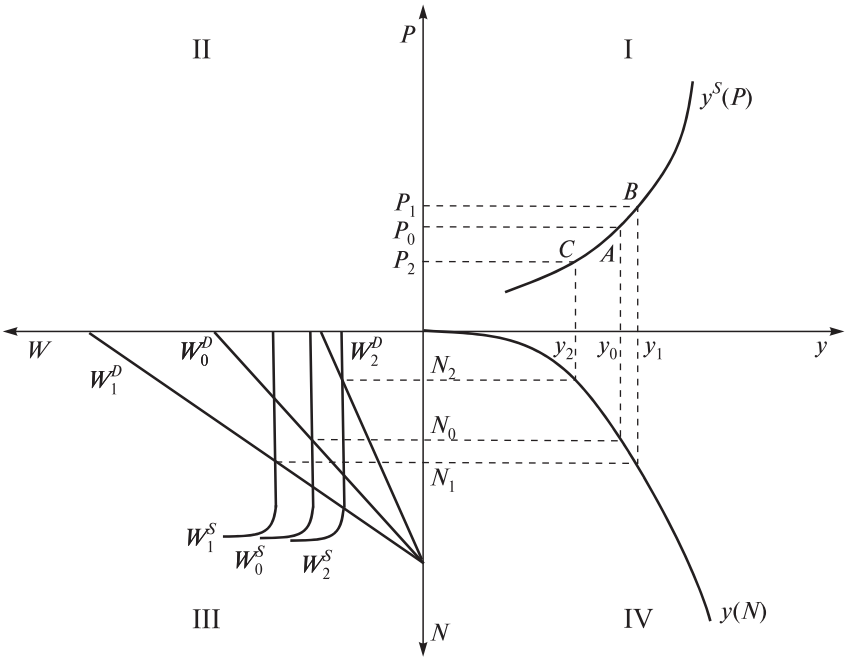

Fig. 6.39. Construction of the aggregate supply curve in the absence of monetary illusions

Unlike the previous one, in this case, when the price level rises, not only the schedule of labor demand shifts, but also the schedule of labor supply. This leads to the fact that the graph of the aggregate supply function with the same production technology becomes steeper (the aggregate supply will be less elastic in terms of prices).

If workers demanded an increase in the nominal wage rate to the same extent as the price level increases, i.e. they would be completely devoid of monetary illusions, then a proportional shift of the N^D and N^S graphs would keep employment at the initial level of N_0 and the graph of the aggregate supply function would occupy a position perpendicular to the abscissa axis. This type takes the total supply schedule according to the neoclassical concept due to the

fact that in it not only the demand for labor, but also its supply is determined by the rate of real, not nominal wages. In this case, the volume of aggregate supply does not depend on the price level (the effects of employment and production are zero). Thus, the angle of the aggregate supply curve depends on the extent to which the growth of the nominal wage rate lags behind the growth of the price level.

The algebraic form of the aggregate supply function is derived by substituting into the production function the value of the equilibrium level of employment found on the basis of equating the price function of labor demand to the price function of labor supply.

We will derive an explicit form of the aggregate supply function in Example in the absence of monetary illusions. From the condition of equilibrium in the labor market, we will determine employment

$$82P - 4PN = 0{,}5N + 10P \Rightarrow N = \frac{72P}{0{,}5 + 4P}.$$

In accordance with the specified technology

$$y^S(P) = \frac{5904P}{0{,}5 + 4P} - 2\left(\frac{72P}{0{,}5 + 4P}\right)^2.$$

The description of the mechanism of functioning of the labor market differs significantly in neoclassical and Keynesian concepts.

Proceeding from the premise of the dominance of perfect competition in the market of goods and labor, neoclassicists state the dependence of the demand for labor on the real wage rate, since its equality of marginal labor productivity is a condition for maximizing profits. With this technique and a fixed amount of capital, a decrease in the real wage rate leads to an increase in demand for labor, and vice versa. The labor supply in the neoclassical concept is an increasing function of the real wage rate and the interest rate. Raising any of them encourages households to replace their free time with workers. The flexibility of prices and the absence of monetary illusions ensure a stable balance in the labor market with full and effective employment. Full employment does not mean the involvement of the entire working-age population in social production: with the current equilibrium labor price on the market, some people may not want to be hired. On the other hand, with a given amount of capital, the marginal labor productivity of this part of the able-bodied population turns out to be lower than the real wage rate, therefore their participation in social production is economically inefficient. It is possible to reduce the number of people who are not involved in social production for

this reason by increasing capital, which contributes to the growth of labor productivity.

According to the Keynesian concept, the volume of demand for labor is determined by the amount of actual demand in the goods market, and the volume of labor supply is determined by the nominal wage rate. In such conditions, a specific equilibrium (quasi-equilibrium) with an oversupply of labor may arise in the labor market. At the same time, the reduction in the real wage rate is not accompanied by an increase in demand for labor.

Depending on the reasons for the existence of unemployment, it is divided into natural and opportunistic. Natural unemployment is associated with imperfect labor mobility: even in a state of full employment, some people are "on the way" from one place of work to another due to professional retraining and the search for the most suitable place.

Over the past 30 years, in many countries with market economies, there has been a tendency to increase the rate of natural unemployment, which is explained by the hysteresis effect and the different market power of the employed and the unemployed.

The difference between actual and natural unemployment is opportunistic unemployment. Its occurrence is associated with the deviation of the actual volume of production from the potentially possible at full employment. The nature of the relationship between the level of conjunctural unemployment and the deviation of the actual national income from the national income of full employment is expressed by the Oaksna curve. As a rule, an increase in conjunctural unemployment by 1 % causes a reduction in national income by more than 1 %. This is due to the fact that during periods of crisis and depression, not all those dismissed are registered as unemployed and the intensity of the use of the remaining workers in production decreases.

With an increase in the prices of goods, each rate of monetary wages corresponds to a large amount of demand for labor. How employment and the supply of goods will change in this regard is determined by the reaction of the labor supply price to an increase in the price level. If the supply price of labor remains unchanged or increases to a lesser extent than the prices of goods increase, then employment and the volume of aggregate supply increase. When the increase in the supply price of labor is equal to or exceeds the increase in the prices of goods, then employment remains unchanged or decreases. Since, according to the ideas of the neoclassicists, monetary wages grow at the same rate as the price level, in their concept the aggregate supply is completely inelastic in terms of price level. In the neoclassical concept, the aggregate supply is an increasing function of the interest rate. In the Keynesian concept, the growth of the nominal price of labor lags behind the growth of the price

level, so the aggregate supply increases as the price level rises. The elasticity of the aggregate supply is less, the less the growth of the nominal wage rate lags behind the growth of the price level.

QUESTIONS

1. What is meant by full-time employment?
2. What is meant by unemployment?
3. What types of unemployment do you know?
4. How to measure the unemployment rate? Analyze the changes in unemployment in your region.
5. What is inflation?
6. What are the causes of inflation?
7. What are the inflation indicators? Calculate the changes in the price indices for the main products of your consumption.
8. What is demand inflation and cost inflation?
9. What are the types of inflation?
10. What is the relationship between inflation and unemployment?
11. Is the Phillips curve outdated?
12. How does inflation affect the redistribution of income, the volume
13. of national production, the interest rate?
14. What are the costs incurred by society due to unemployment?
15. How does economic policy affect inflation and unemployment?
16. What are the main directions of anti-inflationary and
17. employment policy?

7. AGGREGATE SUPPLY AND PHILLIPS CURVE

Basic concepts
Economically active population. Employment of the population. Full employment of the population. Unemployment. Natural unemployment rate. Unemployment rate. Frictional unemployment. Structural unemployment. Cyclical unemployment. Oaken's law. Inflation. Inflation rate. Price indices. Deflation. Open inflation. Suppressed (hidden) inflation. Demand inflation. Cost inflation. Inflation expectations. Expected (predicted) inflation. Unforeseen (unpredictable) inflation. Inflation spiral. Moderate (creeping) inflation. Galloping inflation. Hyperinflation. Inflation tax. Phillips curve. Stagflation.

7.1. THE METHODOLOGICAL FOUNDATIONS OF MONETARISM. THE BASIC EQUATION OF MONETARISM. MONEY RULE

Over the past decades, macroeconomic theory has been the arena of rivalry between two major currents of economic thought – Keynesianism and monetarism. Since the 60s of the XX century, many provisions of the Keynesian concept with the priority of fiscal policy in regulating aggregate demand have been criticized. ***Monetarism*** as a current of economic thought reveals the significant role of money in determining the levels of economic activity and prices. The most prominent representative of the theory of monetarism is the Nobel laureate M. Friedman, who believes that inflation is exclusively a monetary (monetary) phenomenon caused by the growth of the money supply in circulation.

Having the neoclassical quantitative theory of money as a theoretical basis, monetarism focuses on the development of a new version of it, as well as proposals for improving macroeconomic policy.

The term "monetarism" was introduced into scientific circulation in 1968 by the American economist K. Brunner in order to denote the approach according to which the money supply is the main factor determining the economic conjuncture. With a broader interpretation, monetarism can be considered not only as a set of practical recommendations for solving macroeconomic problems, choosing methods of macroeconomic regulation, but also as a kind of economic philosophy alternative to Keynesianism.

The views of monetarists and Keynesians on the problems of internal stability of the market system and the role of the state in this process are opposite in their conceptual basis, but these differences are not always clearly expressed in the analysis tools used. In contrast to the Keynesian concept, according to which a free market system without active government regulation is not able to stabilize the economy with full employment and the absence of significant inflation, monetarism assumes that markets are competitive enough to ensure a high degree of macroeconomic stability. Monetarists consider government regulation to be a factor constraining private initiative and often containing errors that destabilize the economy. The state, implementing fiscal and monetary policy, causes the very instability that these measures are designed to counteract.

Both Keynesians and monetarists base their analysis on equations characterizing the movement of income and expenditure flows in the economy. The Keynesian identity $Y = C + 1 + G + X_n$ focuses on the analysis of the equality of total incomes and planned total expenditures, which determines the macroeconomic equilibrium. In monetarism, the most important equation is the monetary exchange equation $-MV = PY$. Its left part represents the amount of consumer expenses (total expenses), the right –the total revenue of sellers from the sale of goods (total income). Thus, the Keynesian and monetarist equations reflect the same macroeconomic processes, but there are fundamental disagreements about which of the two concepts makes it more adequate.

The main difference between monetarists and Keynesians is the answer to the question: is the speed of money circulation in the economy stable? According to the classical theory, the speed of money circulation is determined by technical and institutional factors – the level of development of the banking system, the established habits of individuals, etc. Therefore, it is stable in the sense that it does not depend on the amount of money in circulation. A change in their supply leads only to a change in the price level (the principle of "neutrality" of money), but does not affect either the volume of national output or the speed of money circulation. The influence of the money supply on the value of the bank interest rate is unpredictable.

Monetarists also consider the speed of money circulation to be stable, since its fluctuations are small and can be predicted, since the factors on which the speed of money circulation in the economy depends change gradually. As proof of this stability, monetarists note the stability of the relationship between the nominal volume of national production and the money supply. In their opinion, the demand for money does not depend on their supply, but is determined by the level of nominal output. The market, in the process

of establishing monetary equilibrium, leads to an equality of the amount of demand for money and its supply, which ensures the stability of the ratio of money supply and nominal output:

$$V = \frac{PY}{M'}.$$

The stability of the velocity of money circulation means that the supply of money is the most important factor determining the nominal volume of national production, the level of prices and employment. Consequently, from a monetarist standpoint, the monetary policy of the state is the most important instrument of macroeconomic regulation. The importance of fiscal policy as a means of stabilizing the economy and redistributing resources is estimated by monetarists to be low. For Keynesians, on the contrary, the main factor determining the real volume of output, employment levels and prices are aggregate expenditures, the components of which are determined by a variety of variables and do not directly depend on the supply of money.

Monetary policy, according to monetarists, in the short term can affect the real level of national production and employment, but in the long term it affects only the price level, so the central bank should stabilize not the interest rate (this is an erroneous goal), but the growth rate of the money supply. Economic instability is generated by incorrect monetary policy rather than internal instability of the market system.

The mechanism of monetary policy in accordance with the monetarist concept is shown in fig. 7.1. If for Keynesians, the impact of changes in the money supply on the dynamics of output and employment is carried out only through a change in the interest rate (which in turn affects the level of investment by private firms), then for monetarists, the change in the money supply directly affects the monetary value of national output, transforming into an increase in prices, and partially (in the short term) – into an increase in real total income. But such a relationship, of course, implies the stability of the speed of money circulation.

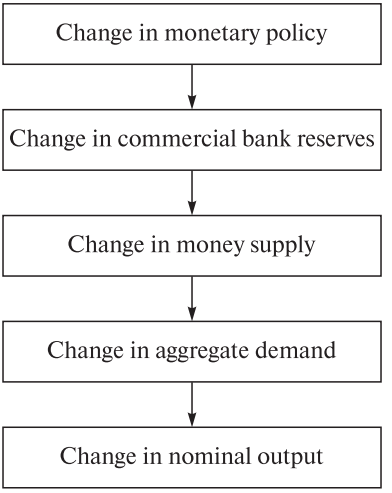

Fig. 7.1. Monetarist transfer mechanism of monetary policy

State intervention in the economy, according to monetarists, is inevitable in many cases, but it should create conditions for the free and stable functioning of market mechanisms based on a rational long-term macroeconomic policy.

In the monetarist concept, monetary policy is a "formidable weapon" because it determines the level of economic activity to a much greater extent than Keynesians believe. Therefore, monetarists advocate the legislative establishment of a monetary rule, according to which the annual growth rate of the money supply should correspond to the average annual growth rate of the real volume of national production. In other words, if the average annual increase in gross national product in real terms is 3–5 %, then the money supply in the economy (money supply) should increase within the specified limits. A smaller increase in it will lead to a shortage of money, and possibly to deflation and unemployment; a larger one will cause inflation. The legislative establishment of a monetary rule will eliminate the causes of instability in the economy, trends towards recession or inflation will be temporary (short-term).

Monetarists believe that the main reason for the shift in the aggregate demand curve is the change in the amount of money in circulation. Since the aggregate supply curve in the long term is almost vertical (which corresponds to the state of the economy close to full employment), the change in aggregate demand will mainly affect the price level *P* and will have little effect on the real volume of national production *Y* (fig. 7.2).

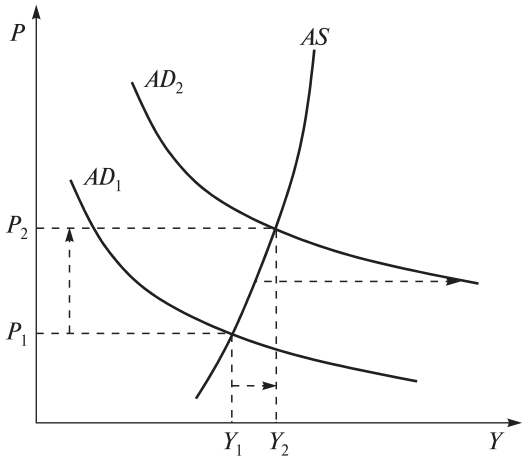

Fig. 7.2. Monetarist model
of aggregate demand and aggregate supply

The monetary rule links an increase in the money supply with an increase in the real volume of output (fig. 7.3). An increase in aggregate demand from AD_1 to AD_2 should correspond to an increase in aggregate supply from AS_1 to AS_2, so that the average price level will not change.

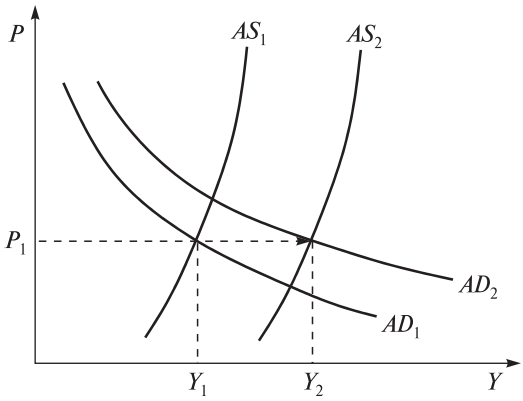

Fig. 7.3. The monetarist rule in the model of aggregate demand and aggregate supply

Monetarists reject fiscal policy as a means of macroeconomic stabilization. They associate its ineffectiveness with the effect of crowding out (replacing) private investments with public ones. When the government runs a budget deficit during an economic downturn, and the amount of money in circulation does not change, government loans lead to an increase in demand for money and, accordingly, an increase in the interest rate, which negatively affects the volume of private investment – it decreases. (Keynesians do not deny the existence of the displacement effect, but consider it insignificant.) When the budget deficit is covered by the issuance of new money, the displacement effect is not observed, but in this case, the growth of economic activity is the result of monetary policy, not fiscal policy. But active monetary policy by monetarists, as shown above, is not welcome, which is explained by two main reasons. Firstly, they indicate the existence of a time lag, which is associated with the uncertainty of the period of influence of monetary regulation measures on the economy (from six to eight months to two years). Accordingly, when these measures begin to take effect, it is possible that the situation in the economy will already be different and the efforts made earlier will only worsen macroeconomic instability. And secondly, the interest rate, which monetary policy is aimed at regulating, is assumed by monetarists to be an erroneous goal.

7.2. PHILLIPS CURVE. THE RELATIONSHIP OF INFLATION AND UNEMPLOYMENT IN THE SHORT AND LONG TERM

The main objectives of economic policy are low unemployment and low inflation. Inflation in the economy is closely related to unemployment. For the first time, the English economist A. W. Phillips drew attention to this. In an article published in 1958, he showed, on the basis of statistical data for Great Britain for 1861–1957, the dependence of the unemployment rate on the salary level. This work has played a big role in macroeconomics. With the help of the Phillips curve, the mechanism of inflation development was investigated and the optimal combination of such contradictory goals of stabilization policy as inflation and unemployment was estimated. Of particular importance was the identification of this dependence for Keynesianism – the explanation of inflation before the appearance of the Phillips curve was a problem for this direction, which was removed because it allowed to link the growth rates of nominal wages and changes in the unemployment rate. Currently, the Phillips curve is considered as an alternative representation of the aggregate supply. It is useful for developing an economic policy to regulate aggregate demand, helps to make a choice between inflation and unemployment, the conditions of which are set by the aggregate supply curve. Analytically, the Phillips curve has the following form

$$g_w = \frac{W - W_{-1}}{W_{-1}} = -f(u),$$

where g_w is the growth rate of nominal wages; u is the real unemployment rate; W is the nominal salary of the current period; W_{-1} is the nominal salary of the previous period.

This attitude is confirmed on the basis of three hypotheses formulated within the framework of Keynesianism and concerning the functioning of the labor market:

1) nominal salary is a variable of regulation in the labor market;

2) in a situation of oversupply of labor, employees are willing to agree to a reduction in nominal wages in order to get a job;

3) nominal wages are very flexible in a period of high conjuncture (unemployment is low) and inflexible in a period of depression (unemployment is high), which confirms the nonlinearity of the "inflation–unemployment" relationship.

The Phillips curve becomes flatter when unemployment increases (fig. 7.4).

For Keynesianism, the Phillips curve is proof of the possibility of choosing between inflation and unemployment. Representatives of Keynesianism

argued that the goal of the state's economic policy is to choose a situation characterized by a certain level of unemployment and the level of inflation that can be allowed to reduce the unemployment rate. At the same time, it was believed that the state could control both of these parameters. Representatives of Keynesianism tried to explain all the processes taking place in the economy by the drift along the Phillips curve. This should mean that full employment can be achieved when the government does not set inflation limits.

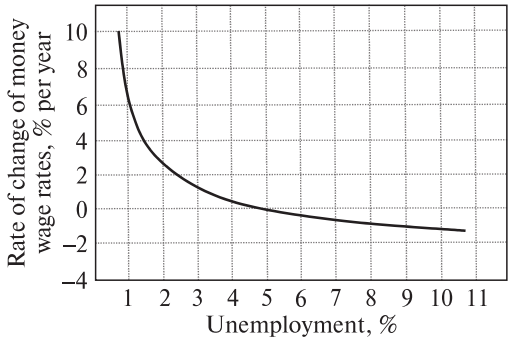

Fig. 7.4. The Phillips curve

In their works, Edmund Phelps (1967), a representative of Keynesianism, and Milton Friedman (1968), a representative of monetarism, predicted that the pattern described by the Phillips curve would disappear. This actually happened in the 70s and 80s. Stagflation in the 70s showed the inconsistency of the conclusions of the Keynesian theory.

E. Phelps and M. Friedman have shown that the Phillips curve is unable to describe the actual relationship between wage inflation and the unemployment rate, because it takes into account the influence on the level of nominal wages only the level of employment. In their works, they proposed to modify the Phillips curve by including the expected inflation:

$$g_w = -\alpha(U - U^*) + \pi^e.$$

The Phillips curve is based on factors that explain the intermediate segment of the aggregate supply curve. As the economy moves towards full employment, certain imbalances arise in the labor market – "bottlenecks" and structural problems. The aggregate labor market consists of many separate labor markets that differ from each other both in specialization and geographically. This diversity of labor markets suggests that as the economy grows, full employment

will not be achieved simultaneously in every single market segment. While full employment and even a shortage of labor resources will be formed in some segments of the labor market, unemployment will remain in others. This discrepancy means that in a growing economy with a general level of unemployment, certain professions and certain areas will experience a shortage of labor, as a result of which wages in such market segments will increase. A higher salary means higher costs and an inevitable increase in prices. Eventually prices will rise, even though the economy as a whole has not yet reached full employment. Shifts in the labor market are not happening fast enough to eliminate the problem of shortage of labor resources. This is also facilitated by artificial restrictions on the movement of labor (for example, discrimination based on race, ethnicity or gender). The need to obtain professional licenses or trade union restrictions make it difficult to equalize the imbalances between individual labor markets. Thus, the adaptive reaction of the labor market is not fast enough and complete enough to stop the growth of production costs and product prices, which outstrips the achievement of full employment by the economy.

The relationship of the Phillips curve and the *AS* curve can be derived mathematically. Let's express the aggregate supply curve through the equation

$$P = P^e + \frac{1}{\alpha}(Y - Y_f).$$

If we subtract the price level of last year P_{-1} from the right and left parts, we get

$$P - P_{-1} = (P^e - P_{-1}) + \frac{1}{\alpha}(Y - Y_f).$$

The left side of the equation represents the difference between the current price level and the price level of last year, which is equal to the rate of inflation. In the right part we get the expression $(P^e - P_{-1})$ representing the difference between the expected price level and the price level of the previous year, i.e. the expected rate of inflation.

Using the dependence formulated by Oaken's law, it is possible to replace the difference between the actual and potential production volumes $(Y - Y_f)$ by the deviation of the actual unemployment rate from the natural one. It is also necessary to take into account the shocks of the supply of ε. As a result, the Phillips curve will mathematically take the form

$$\pi = -\beta(U - U^*) + \pi^* + \varepsilon.$$

Thus, it is possible to move from the aggregate supply equation to the Phillips curve equation. There is reason to believe that the Phillips curve equation is a special case of the aggregate supply.

The Phillips curve can be useful for practical application if you clearly formulate what determines the expected inflation. The simplest and most frequently encountered assumption is that economic entities use adaptive expectations, i.e. they assume that prices will rise in the current year to the same extent as in the previous one. This means that inflation is an inertial process. If unemployment remains at a natural level and there are no sharp fluctuations in supply, then prices will grow at a constant pace. Inertia arises due to the influence of past inflation on the currently set wages and prices.

In the *AD–AS* model, the inertia of inflation is explained as follows.

The first term of equality $(U - U^*)$ shows that cyclical unemployment has a restraining or stimulating effect on inflation. The low unemployment rate stimulates the growth of inflation, because high demand for goods and services allows firms to raise prices. Thus, demand inflation is developing. High unemployment slows down the rate of inflation due to falling demand for goods. The coefficient β shows how strongly inflation reacts to cyclical unemployment.

The second term of the equality of π^e reflects the impact of expected inflation. If prices grew rapidly in the past period, then business entities expect their further rapid growth. Since the location of the short-term *AS* curve depends on the expected price level, it will shift upwards over time. The movement will continue until some event (supply shock or crisis) changes the current level of inflation and, accordingly, expectations about future inflation.

The third term of equality e shows that inflation can rise as a result of a supply shock (rising oil prices, an increase in the minimum wage), when production costs rise and, to compensate for them, firms need to raise prices. Thus, the third element of equality reflects cost inflation. It should be noted that supply shocks can also have a restraining effect on inflation (the fall in oil prices at the end of 2008–2009 under the influence of the global economic crisis).

The first satisfactory attempt to explain the Phillips curve was made by R. Lipsey in 1960. He reviewed the labor market, which is segmented by territory, professions and qualifications. An increase in demand for certain professions in certain segments in conditions of full employment leads to an increase in nominal wages, causes an increase in the prices of goods. Equilibrium in the labor market is achieved if the number of unemployed is equal to the number of vacancies. Lipsi does not explain the behavior of subjects in the labor market. Nevertheless, his work is of great importance, because it puts forward the idea of an equilibrium unemployment rate, which is due to the characteristics of the labor market. In the neoclassical labor market, the

number of vacancies and unemployed is zero, because there is full employment. In a complex world where asymmetry and incompleteness of information are inevitable, zero unemployment is illusory. Consequently, the equilibrium in the labor market can be assumed with a positive unemployment rate.

Friedman and Phelps rejected Lipsey's idea. M. Friedman proves that the problem of "inflation–unemployment" in the short term exists due to a shift in the equilibrium position in the labor market. The explanation of the negative relationship between the growth rate of nominal wages and the unemployment rate in the short term, representatives of monetarism build on the assertion that real wages do not return to the previous level immediately after price increases. In their opinion, the reason for the delay in adaptation is that workers, focusing on real wages, offering a certain amount of labor and not knowing the actual price level, calculate real wages based on inflation expectations built in an adaptive way. That is, in reality, the labor supply is determined by the expected real salary, which may differ from the actual one if inflation expectations do not coincide with actual inflation.

When there is an increase in prices in the economy, initially the inflationary expectations of workers will not take into account the price jump that has occurred, because expectations were built in an adaptive way. The expected price level will be less than the actual one, i.e. the expected real salary will be more than the actual one. Workers, believing that their real wages have increased, will offer more labor, and the volume of production will be greater than before. Then workers will gradually adjust their inflation expectations to the actual change. The expected real salary will approach the actual one, and the volume of production will tend to the potential level. In the long term, when workers fully adjust their inflation expectations to the changes that have occurred, the actual and real wages will be equal, the volume of production will be set at a potential level. Consequently, according to this interpretation, while the inflation expectations of individuals have not changed, the relationship between the growth rate of nominal wages and the unemployment rate was described by the short-term Phillips curve corresponding to previous inflation expectations. When inflationary expectations change, the Phillips curve shifts upwards, because now it describes the relationship between the growth rate of nominal wages and the unemployment rate with higher inflationary expectations. So, the Phillips curve can be represented as a set of curves, each of which corresponds to a certain level of inflation expectations.

The assumption that economic agents are guided by the real, rather than nominal, salary level leads to the fact that inflation becomes the most important factor affecting the growth rate of nominal wages, since

$$g_w = g_w - g_p.$$

A new explanation of the Phillips curve is the use of markets of *imperfect competition of factors of production*. The labor market provides an opportunity for trade unions representing the interests of workers to demand an increase in wages as the labor market approaches the state of full employment, which causes an increase in costs and price increases in the economy. If unemployment is high, then trade unions agree to lower wages in order to provide more employment in the economy.

7.3. THE THEORY OF RATIONAL EXPECTATIONS. THE LONG-TERM PHILLIPS CURVE IN RATIONAL EXPECTATION THEORY

Representatives of monetarism modified the Phillips curve and used it to substantiate the main provisions of their theory:

– the money supply affects inflation the most;

– money is neutral only in the long term, in the short term there is no neutrality of money, because a change in the amount of money affects a change in the price level with some lag;

– the economy has more stability when the state does not interfere in the economy;

– the state should focus on monetary policy, since it affects both output and inflation in the short term, and only inflation in the long term.

M. Friedman made a certain contribution to the development of the Phillips curve theory – he put forward three hypotheses.

1. The functioning of the labor market is characterized by an asymmetry of information between those who demand and those who offer.

2. Subjects form inflationary expectations.

3. There is a natural unemployment rate in the economy.

From the point of view of M. Friedman, ***the asymmetry of information*** lies in the fact that entrepreneurs are well informed about the development of their nominal costs and the price of their products. Employees cannot immediately determine the change in the purchasing power of money. They are victims of money illusions. Due to the multitude of goods whose prices are constantly fluctuating, it is impossible to track the change in the overall price level. It takes time for employees to feel the actual change in prices, i.e. they cannot state the change in real wages. Thus, representatives of monetarism explain the short-term Phillips curve.

Economic agents operating at the present moment cannot determine the price change in the future, which affects the growth rate of nominal wages. They can only build expectations about the changes that will occur in the future.

M. Friedman has developed a mechanism describing how inflation expectations are formed, which are called "adaptive inflation expectations". Adaptive expectations are expectations that are constructed as follows in the discrete case:

$$\pi_t^e = \pi_{t-1}^e + \nu(\pi_{t-1} - \pi_{t-1}^e),$$

where π_t^e – inflation expectations of the t-th period; π_{t-1} – actual inflation $(t-1)$-th period; π_{t-1}^e – inflation expectations of the $(t-1)$-th period; ν – the coefficient of adaptation (the rate of adaptation) of inflationary expectations.

In the continuous case, the equation takes the form:

$$\pi^e = \nu(\pi - \pi^e).$$

This mechanism takes into account past mistakes. If inflation is overestimated, then $(\pi_{t-1} - \pi_{t-1}^e) < 0$, and inflation expectations of the given period π_t^e will be less than inflation expectations of the previous period π_{t-1}^e.

If inflation is underestimated, then $(\pi_{t-1} - \pi_{t-1}^e) > 0$ and inflation expectations of the current period π_t^e will be greater than inflation expectations of the previous period π_{t-1}^e.

If the coefficient of adaptation is small (ν is close to 0), then adaptation to reality is slow, if the coefficient of adaptation is large (ν is close to 1), then adaptation to reality occurs quickly. If the adaptation coefficient $\nu = 1$, then inflation expectations are fully based on the previous level of inflation (the projected inflation is equal to the current one):

$$\pi_t^e = \pi_{t-1} - \text{naive inflation expectations.}$$

If the adaptation coefficient $\nu = 0$, then inflation expectations are completely based on previous inflation expectations:

$$\pi_t^e = \pi_{t-1} - \text{static inflation expectations.}$$

Adaptive inflation expectations have significant drawbacks:

– the presence of systematic errors;

– the presence of a time interval during which inflation expectations adjust to the actual level of inflation.

The concept of ***"natural unemployment rate"*** was introduced by M. Friedman. He defined it as "a level that is justified by a system of general equilibrium equations according to Walras...". The natural unemployment rate corresponds to the long-term equilibrium of the economy. In the short term, the unemployment rate may differ from the natural unemployment rate. This affects the salary change. At $U > U^*$, the level of real wages decreases, at $U < U^*$ – increases.

The natural unemployment rate is essentially a long-term equilibrium unemployment rate. A *simple dynamic model of unemployment* (the model of the natural unemployment rate) is used to prove this position.

For simplicity, the model assumes:

– the number of jobs and the number of job seekers are the same;

– the number of workers is fixed and equal to N.

Let U be the share of the unemployed in the labor force, s be the share of the dismissed labor force, and f be the share of the unemployed who have found a job. Then, for each moment of time t, we can determine the number of workers who have become unemployed: $s(1 - U) \cdot N$.

It is possible to determine the number of unemployed who have found a job by multiplying the share of unemployed who have found a job by the share of unemployed in the workforce and the number of the workforce: fUN.

The labor market, which was previously in a state of equilibrium, will remain in a state of equilibrium if the number of workers who have become unemployed is equal to the number of unemployed who have found work:

$$s(1 - U) \cdot N = fUN.$$

It follows from this equality that $U^* = s/(s + f)$, where U^* is the unemployment rate corresponding to the equilibrium of the labor market, i.e. the natural unemployment rate.

In this model, the dynamics of unemployment can be described by a differential equation reflecting the difference between the number of dismissed and the number of unemployed who have found work:

$$d(UN)/dt = s(1 - U) \cdot N - fUN.$$

Since the labor force is a value exogenously set in this model, we get from this equation that the dynamics of unemployment will be set by the dynamics of the share of unemployed in the labor force:

$$U^* = s(1 - U) - fU.$$

Having solved this differential equation, we obtain

$$U(t) = U^* + (U(O) - U^*)e^{-\{s+f\}t}.$$

It follows from the equation that if s is the share of the dismissed labor force and f is the share of the unemployed who have found work, these are constant values and in total greater than zero:

$$[s + f] > 0, s, f - \text{const},$$

then in the long term, the unemployment rate always tends to the natural unemployment rate:

$$U(t) \to U^*.$$

Such dynamics of the unemployment rate means that in the long term, the unemployment rate does not depend on the level of salary change. This means that in the long term, the Phillips curve is a vertical line at the level of the natural unemployment rate (fig. 7.5).

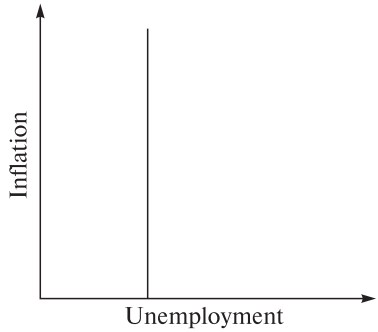

Fig. 7.5. The Phillips curve of the long-term period

The importance of Friedman's three hypotheses is determined in a dynamic perspective. Representatives of monetarism believe that the state should achieve price stability in the economy while ensuring full employment. In support of this thesis, the concept of a long-term Phillips curve was formulated, which:

– reflects the process of stagflation: inflation increases, while the unemployment rate does not decrease;

– confirms the correctness of the theory of money neutrality in the long term, because it shows that the only result of an increase in the money supply is an increase in the price level.

According to the monetary mechanism of inflation development, in the long term it is impossible to keep the unemployment rate below the natural level at a constant rate of money supply growth. Such a policy can only lead to temporary successes. If the government wants to achieve a sustained high level of employment, it will have to accelerate monetary momentum, which will lead to an acceleration of inflation.

Based on this understanding of the development of inflation, representatives of monetarism have deduced two rules that should guide the state in stabilizing the economy:

1) in an economy suffering from high inflation, inflation should be reduced by pursuing a tight monetary policy. In this case, in the short term, despite the

decline in production, inflation will decrease, in the long term, production will return to the previous level, and inflation will become significantly lower;

2) the government, trying to maintain unemployment at a level below natural through a policy of stimulating demand, should do it very carefully, because such a measure provokes an acceleration of inflation.

7.4. SUPPLY ECONOMICS AND THE LAFFER CURVE

The economic theory of supply

Along with monetarism, the economic theory of supply arose within the framework of the conservative trend of economic thought in the 1980s, based on the assumptions about the efficiency of the market in the field of resource allocation and price setting, about the rationality of economic entities and optimization as the basis of their behavior, about the formation of macroeconomic dependencies based on simple aggregation of micro-dependencies.

The economic theory of supply is a set of theoretical propositions that emerged in the 1980s on the basis of the neo-Austrian school, the theory of marginal efficiency of factors of production and monetarism, based on the fact that the effective distribution and use of resources is the most important factor in the growth of national production both in the short and long term, and therefore special attention is paid to the type and the position of the long-term function of the aggregated supply of factors of production.

Supply theory studies the impact of fiscal policy on aggregate supply, and, consequently, on the efficiency of the distribution and use of factors of production, inflation, unemployment, stagflation, the process of capital accumulation and economic growth.

Supply theorists proceed from the fact that changes in the level and structure of taxes or government transfers make it possible to influence the process of distribution and use of factors of production at the micro level by influencing the supply of capital (the choice of individual economic entities between consumption and savings, between current and future consumption) and the supply of labor (the choice of individual economic entities between labor and leisure). At the same time, it is taken into account that with the simultaneous distorting effect of taxes on factor incomes that determine the supply of factors of production, there is also a distorting effect on factor costs that determine the demand for factors of production from corporations. There is a so-called “tax wedge”, reducing which, as well as promoting

competition, it is possible to stimulate aggregate supply and thus solve a number of macroeconomic problems, the main of which are stagflation and slowing economic growth.

The reasons for the increase in ***unemployment***, from the point of view of representatives of the economic theory of supply, are: an increase in the payroll tax; the payment of unemployment benefits or the provision of other government transfers that weaken the incentives for the employed population to work (compared with leisure) and reduce the desire of the unemployed to find work.

The reason for inflation may be: ***high taxes on factors of production***, which reduce the efficiency of their use and distribution between competing areas; high corporate income tax, which reduces the intensity of capital accumulation in the private sector; government actions that cause unexpected fluctuations in production costs (financial sanctions, requirements to invest in sewage treatment plants, etc.). As a result, economic subjects are faced with an additional tax – ***an inflationary tax*** that enters the state's income in the form of the amount of tax payments multiplied by the rate of inflation.

The reason for the ***slowdown in economic growth*** is the shortage of savings, which can be caused by a number of factors:

– the payment of state transfers distorts the choice between consumption and saving, increasing the incentives for current consumption due to the formation of expectations about obtaining permanent additional income in the first (for example, unemployment benefits) or in the second half of life (for example, old-age pensions). This leads to a decrease in the share of savings in disposable income, and hence to a slowdown in economic growth.;

– an increase in the rates of taxes on interest income, capital asset gains, dividends and other taxes on property income leads to a decrease in the propensity to save compared to consumption, reduces the supply of loan capital and increases the nominal interest rate, which slows down the investment process and economic growth;

– an increase in corporate income tax reduces incentives to invest by reducing the level of dividends paid, which reduces the market value of the company's assets, does not contribute to attracting external funds, does not allow expanding the sources of internal accumulation resources, replacing outdated equipment, introducing scientific and technological progress into production, and therefore slows down economic growth;

– the increase in taxes on wages and other labor incomes reduces the supply of labor and makes it impossible to ensure the process of capital accumulation with the necessary increase in labor resources. This leads to a decrease in the rate of accumulation and a slowdown in economic growth, to

a reduction in the share of labor income in national income, which requires an increase in social spending of the state budget, and, consequently, other taxes.

Laffer curve

Taking into account the fiscal function, a properly constructed tax system should lead to the *maximum amount of tax fees*. This requires *rational tax rates* and tax benefits in the form of accelerated depreciation, investment credit, etc., which stimulate economic growth and at the same time increase the total amount of tax revenues to the state budget.

The theoretical justification of rational tax collections was the calculations of the American economist A. Laffer, who proved that reducing tax rates to the maximum optimal value contributes to the rise of production and income growth.

The graphical representation of the relationship between budget revenues and the dynamics of tax rates has been called the "Laffer curve" (fig. 7.6).

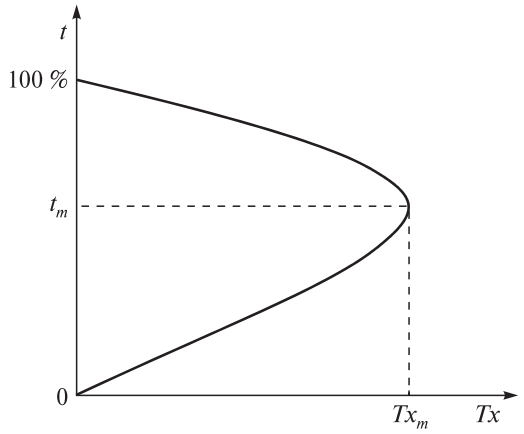

Fig. 7.6. Laffer curve

In the figure, tax rates t are deferred along the ordinate axis, and budget receipts *Tx* are deferred along the abscissa axis. With an increase in the tax rate t, the income of the state as a result of the taxation of *Tx* increases. The optimal size of the rate is tm, the maximum revenue to the state budget is Tx_m. With further tax increases, incentives to work and entrepreneurship fall, and with 100 % taxation, the state's income is zero, since no one wants to work without receiving income.

However, from the point of view of the *regulatory role* of taxes, it is important that tax rates are really flexible and their changes correspond to the *phases of the economic cycle*. Thus, during the recession and depression, the *reduction of tax rates will stimulate the growth of social production*. *Raising tax rates during the industrial boom*, a kind of "overheating" of the economy, may prove to be an effective *anti-inflationary measure*.

7.5. SHOCKS OF AGGREGATE SUPPLY. STAGFLATION. STABILIZATION POLICY: STATE REGULATION OF EMPLOYMENT, ANTI-INFLATIONARY POLICY

The aggregate supply is also influenced by non-price factors that change business behavior at any price levels. In the economic literature, they are called ***supply shocks***. Let's list the main ones.

1. Prices for resources, including imported ones. Factors affecting resource prices:

– availability of domestic resources (the more of them, the lower the prices of resources and the greater the aggregate supply);

– prices for imported resources (the higher the prices, the lower the aggregate supply);

– the level of monopolism of resource suppliers (the higher the degree of monopolism and the more opportunities to raise the price level, which reduces the aggregate supply).

Suppose the economy is in a situation close to full employment (at the intermediate segment of the *AS* curve), and at this time prices for imported resources, for example, oil, are rising. The costs of national business per unit of goods will increase, which will lead, with unchanged material and financial resources, to the need to reduce production volumes.

The same will happen if the economy is initially in a situation of full employment (on the classical segment *AS*).

If initially the economy is in a situation of underemployment (in the Keynesian segment *AS*) and a reduction in production volumes is impossible due to constant demand, then an increase in prices for imported resources will lead to an increase in the overall price level in the economy with unchanged sales volume. Thus, the AS line shifts to the left-up (fig. 7.7).

2. Resource productivity (technological progress). All other things being equal, if the productivity of resources increases, then the aggregate supply increases (*AS* shifts to the right-down), because with the same volumes of factors of production, a larger volume of products can be produced.

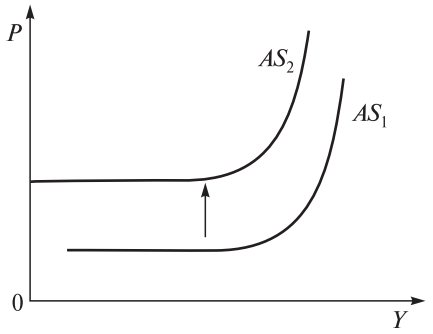

Fig. 7.7. Influence of non-price factors on the shift of the *AS* curve

3. Taxes on business *T*. If taxes increase, it worsens the financial situation of the business and, all other things being equal, reduces the aggregate supply.

4. Business subsidies. If business subsidies grow, then the aggregate supply increases, because business conditions are improving.

A situation in which, under the influence of supply shocks, output decreases, causing an increase in unemployment, while prices rise, is called ***stagflation*** in economic theory.

General approaches. Classification of the macroeconomic policy of the state. In economic theory, there is a fairly wide variety of theories explaining the causes of the crisis in the economy and offering various approaches to overcoming it (table 7.1).

Table 7.1

Causes and recommendations for overcoming the crisis

Causes	Recommendations
Price and wage rigidity hinders full-employment equilibrium	Pursuing a stimulating monetary and tax policy
The expected decrease in real wages, caused by the expectation of a decrease in the money supply, leads to a reduction in the supply of labor, employment and output decrease	Only unexpected changes in the money supply can affect employment and output
Rigidity of nominal wages and prices, long-term contracts, imperfect information, menu costs hinder achieving equilibrium at full employment	Depending on the cause of hardness nominal performance both expected and unexpected changes money supply can lead to a change in income

The end of table 7.1

Causes	Recommendations
The inability for firms to pursue a coordinated policy leads to an equilibrium at a low level of production (Pareto inefficient)	Government intervention can help the private sector choose a high output equilibrium (Pareto efficient)
Voluntary reduction of labor supply by workers during periods of low wages resulting from negative technological shifts	Since unemployment is voluntary, the conduct of economic policy is irrational

Economists offer a fairly wide range of tools to influence the economic equilibrium. The state can stimulate the economy during a downturn and use a restraining policy during an upturn to prevent the economy from "overheating". However, if everything were so simple in reality, there would be no booms and crises, the economy would develop progressively. Deviations from the trajectory of development could be explained by the wrong economic policy of the state. But it is often very difficult to explain a specific crisis from the standpoint of a single theory of the business cycle.

Therefore, there is no consensus on ways to overcome the instability of the economy. It should be noted that in a situation of stagflation, high unemployment and inflation are combined, and both problems need to be solved. However, in reality, society pursues different goals, which sometimes contradict each other. For example, trying to fight inflation by pursuing a policy of "expensive" money, in the short term they get a decrease in output and an increase in unemployment.

In economic theory and economic policy, the question *often arises of assessing the costs of society to combat inflation and unemployment*, because according to theoretical concepts that follow from the Phillips curve, stabilization macroeconomic policy leads to an increase in inflation rates. Therefore, there is a discussion about the comparative costs of unemployment and inflation. It is believed that the benefits of reducing unemployment can be overestimated by the government, since it is difficult to estimate potential GDP and, consequently, to measure the gap between it and real GDP. Therefore, it is unclear when unemployment is voluntary and when it is forced. On the other hand, the costs of inflation may be underestimated by the government, since it is difficult to estimate the costs associated with the uncertainty of inflation rates, as a result of which economic entities refuse to invest. At the same time, the gains from the fight against unemployment may be large, but temporary (until the volume of production reaches a potential level). The costs of the

resulting inflation may be insignificant in each period, but their cumulative effect will be significant, because in the long-term equilibrium, the inflation rate will constantly increase. Therefore, when making decisions on the implementation of a stabilization policy, it is necessary to compare the above costs of inflation with the current gain from a decrease in the unemployment rate.

There may be a problem in the economy, even if the government pursues only one goal: achieving output at full employment. The problem is that when the state tries to neutralize the effect of a supply or demand shock, production reacts to the policy gradually due to inertia. It should also be taken into account that it is difficult to predict the degree of reaction of the economy to a particular economic policy.

Possible government reactions to economic shocks can be divided into two types.

The first is ***a passive policy*** (laissez-faire policy), when nothing is being done to facilitate the rapid return of the economy to production at full employment. In accordance with the neoclassical approach, in this case, the economy will eventually return to long-term equilibrium on its own.

The second is ***an active stabilization policy*** aimed at neutralizing the effects of the shock. In this case, the question arises about the form of such a policy. It can be:

– a policy of freedom of action;

– the policy of a firm course.

The ***policy of freedom*** of action (inconsistent macroeconomic policy) means that the government assesses the problems in the economy in each specific case and selects the appropriate policy for this. Such a policy is also called discretionary.

The policy of a firm course is based on the government following predetermined rules. It assumes an appropriate package of measures that can be used in a specific situation. These measures are limited by quantitative limits, which are selected as targets and cannot be changed in accordance with the current economic situation (the policy of embedded stabilizers). Examples of such policy options, their advantages and disadvantages are given in table 7.2.

The *policy of a firm course* can be passive or active. An example of a passive policy of a firm course is the desire of the National Bank of the country to issue money within 5 % regardless of the dynamics of the unemployment rate. With *an active policy* of a firm exchange rate, the National Bank stabilizes the state of the economy by expanding the supply of money in the event of an increase in unemployment. In this case, the rule applies, according to which the supply of money should be increased by *x* % in response to an increase in unemployment (compared to the natural level) by 1 %. This means that in case of negative

shocks, monetary expansion will be applied in the form of a pre-formulated response rule. In this case , the money supply is described by the equation

$$\Delta M/M = 5\ \% + x(U - U_{-1}).$$

Table 7.2

Alternative policy options for a firm course

Target variable that is fixed	Advantages	Disadvantages
The growth rate of the monetary base	Can be implemented by the National Bank. Provides nominal anchor	Can lead to fluctuations in unemployment and inflation rates
Nominal interest rate	Can be implemented by the National Bank in the short term period	Fluctuations in aggregate demand can cause fluctuations in the unemployment rate. Does not provide a nominal anchor, which means there are no restrictions on inflation
The growth rate of money supply unemployment and inflation rates	Provides a nominal anchor	It is difficult to control the money supply. Volatility in demand for money can cause level fluctuations
Nominal GDP growth rate	Provides a nominal anchor	Difficult to control
Inflation rate or price level	Provides nominal anchor. If implemented successfully, it stabilizes inflation expectations and avoids the problem of inconsistency in time	Difficult to control. Generates significant fluctuations in the unemployment rate
Unemployment rate or real GDP growth rate	Avoids losses from fluctuations in unemployment. Allows households to form the right expectations	Difficult to control. Does not provide a nominal anchor and generates significant fluctuations in the inflation rate

Problems of conducting an active stabilization policy. The possible destabilizing effects of an active policy of managing aggregate demand are explained by the presence of lags and the uncertainty of the effect of this policy.

Lag in the economic literature refers to the time that passes between the moment of awareness of the need to change the policy and the moment when this policy gives a concrete result. It is usually considered that this lag is the sum of internal and external.

The internal lag is the time that passes from the moment of awareness of the need to change economic policy to the moment of its implementation. Internal lags include:

– the recognition lag is the period of time from the moment of shock to the moment when the decision-maker realizes that the shock has occurred. This lag may be absent (or negative) if the shock was predicted in advance. For example, you can predict seasonal fluctuations in demand (supply) and take action even before the shock occurred. The duration of this lag is largely related to the level of competence of management personnel;

– the decision lag is the period of time required to predict the consequences of the shock and develop an appropriate solution. In addition, it takes time to make a decision. For example, in order to change the tax policy, it is necessary to develop an appropriate law and get its approval in the legislative bodies. The duration of this lag depends on the instruments of political influence on economic processes chosen by the government.

From the point of view of the internal lag, monetary policy has undoubted advantages. The implementation of this policy requires only the decision of the National Bank. It may take several months to change the fiscal policy, since a government decision and its approval by the legislative bodies are necessary, after which the decree is signed by the president.

The external lag is the time that passes from the beginning of the implementation of economic policy to the moment when it brings results. The second type of lags is associated with the impact of economic policy on the economy and is called the impact lag. After the decision is made and implemented, the changes made gradually begin to affect the behavior of economic entities and the state of the economy.

The external lag differs from the internal one in that during this period the economy reacts to the changed conditions. The duration of the external lag depends on the instruments chosen by the government and the mechanism of functioning of the economy.

From the point of view of the external lag, fiscal policy has an advantage, since it directly affects production conditions. The implementation of monetary policy requires large external lags. Its impact on the economy is indirect, it is associated with changes in interest rates, which, in turn, affects investment decisions that are not reviewed immediately, because they are planned in advance. Therefore, the results of monetary policy can be expected for quite a long time.

The comparative effectiveness of fiscal and monetary policy also depends on the corresponding multipliers. Choosing a specific form of policy is very difficult, because both lags and multipliers should be taken into account.

On average, the lags of fiscal and monetary policy are 1–2 years. If stimulus measures were taken during the recession, then the peak of the impact may manifest itself in the opposite phase of the cycle (i.e., in the upswing) and strengthen economic growth, thereby increasing the amplitude of fluctuations. Conversely, the restraining policy will begin to have an impact on the economy after passing the peak of the recovery.

Then its consequence may be an intensification of the recession. This complicates the implementation of an active stabilization policy.

Let's assume that initially there was a volume of production in the economy corresponding to full employment. The unexpected negative shock of aggregate demand led to a reduction in output below the level corresponding to full employment. Since this shock turned out to be unexpected, no warning measures were taken. The Government should decide whether to take any action and, if so, which ones.

First of all, the government must determine whether this shock is permanent or temporary. If the shock is permanent, then the unfavorable situation will continue in the future. If this is a temporary reduction in demand, then in the next period the economy will return to its original position. The best policy in this case will be a policy of non-interference, because even the actions taken today aimed at smoothing the effects of the shock will affect the economy with a certain lag and may lead to additional deviations from the potential output, as shown in fig. 7.8.

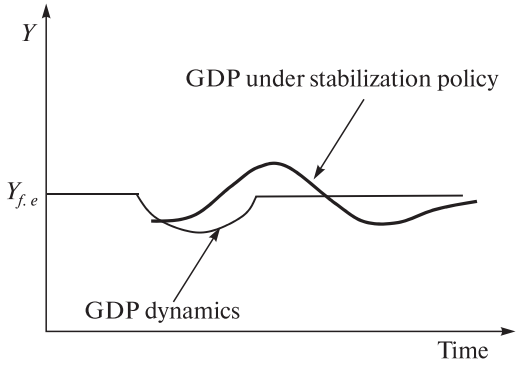

Fig. 7.8. Distortions caused by the stabilization policy during a temporary shock

The problem is that, on the one hand, the results of macroeconomic regulation largely depend on expectations, but, on the other hand, expectations themselves are determined by economic policy measures. When changes occur in the policy of the government and the National Bank, both expectations and behavior of economic agents are reconstructed.

In order to effectively manage the economy, it is necessary to predict these changes using rather complex economic models for calculations.

In general, the content of Lucas' criticism boils down to the fact that traditional methods of economic policy analysis cannot adequately reflect the impact of political changes on economic expectations. This is essential for calculating the levels of expected inflation and developing an anti-inflationary policy strategy. The adaptive component of expected inflation can be calculated as the sum of the inflation rates of previous years, and the coefficient for each subsequent term characterizing the removal into the past turns out to be less than that of the previous one:

$$\pi_e = 0.4\pi_{-1} + 0.2\pi_{-2} + 0.1\pi_{-3} + \ldots + \delta,$$

where π_{-1} is the inflation rate of the previous year; π_{-2} is the inflation rate of two years ago; π_{-3} is the inflation rate of three years ago, etc.

The expected inflation equation is an integral part of the general *AD–AS* equilibrium model. The external variables of the model are government spending, taxes, money supply, price shock. As a result of solving the model, probabilistic values of employment levels, output, unemployment, and inflation are derived, which can serve as guidelines for developing alternative strategies for macroeconomic stabilization.

With prolonged inflation, economic entities cease to be mistaken about the consequences of fiscal and monetary expansion. They are more interested in economic information, quickly recognize goals and predict the results of government actions, which helps to avoid past mistakes when making decisions. This means that the inertial component of expected inflation gradually decreases and eventually disappears altogether. At the same time, the rational component of expected inflation associated with changes in macroeconomic policy is increasing. It is this component that is most difficult to quantify, i.e. the results of solving the *AD–AS* model cannot be absolutely reliable, which complicates the choice of economic stabilization measures.

When implementing a stabilization policy, it is important for the government to assess how strongly the economy will react, what will be the multiplier value of this policy. The following problems arise.

1. Uncertainty of the multiplier of economic policy. The government cannot accurately assess the effect of its economic policy.

2. Econometric forecasting models that are based on estimates for past periods and do not take into account that changes in economic policy affect the expectations of economic agents, and expectations affect the multiplier. If, using such models, one tries to predict how the economic equilibrium will react to a particular change in economic policy, then one can get incorrect estimates, because the policy pursued with rational expectations will be reflected in the expectations of economic agents, which means that the values of the multipliers used in making the forecast may change after the change in expectations. subjects. The argument about the inadequacy of econometric forecasts that do not take into account changes in the expectations of agents is known in the economic literature as the "Lucas critique";

3. Inconsistency in time. The problem is that the government announces a certain policy that it considers the best. Based on this, the private sector makes choices about investment and consumption. When the private sector has made its choice, the state can change the previously announced policy, considering that it is more profitable for it. An example of the inconsistency of fiscal policy over time can be the following actions of the government:

a) to stimulate investment activity, the government announces the exemption of capital income from taxes. But after firms have invested, it turns out to be interested in reneging on its promises, since taxes on already functioning capital do not undermine economic incentives;

b) the government promises to severely punish those who evade taxes. However, after the evasion has already occurred and is discovered, the government can resort to a tax amnesty, thanks to which the perpetrators will be able to avoid punishment, provided they pay all taxes.

The implementation of a stabilization policy is complicated by the fact that many economic events are practically unpredictable. These difficulties of macroeconomic forecasting are partially overcome by expanding and complicating macroeconomic models that allow predicting the dynamics of the main indicators of economic development. The index of leading indicators, combining 11 data blocks, provides the necessary information about possible fluctuations in the economy. It includes the following indicators.

1. The average length of the working week. The reduction in the length of the working week indicates a possible decrease in the volume of GDP in the future.

2. Initial applications for unemployment insurance. The increase in the number of primary claims for benefits is associated with a falling level of employment and production.

3. New orders for the supply of consumer goods. A reduction in the number of such orders precedes a drop in GDP.

4. Stock market prices. The decline in stock prices is a reflection of the expected decrease in corporate sales and falling profits, and also causes a reduction in consumer spending and makes the issue of new shares less attractive to firms, which can cause a drop in GDP.

5. Contracts and orders for new machines and equipment. A decrease in the volume of orders for production equipment and other investment goods means a reduction in the volume of GDP in the future.

6. The number of licenses for housing construction. The fall in this indicator precedes a reduction in investment and GDP.

7. Execution of orders for the supply of materials and components. The improvement in the activity of trading enterprises for the timely supply of materials and components to customers indicates a reduction in demand from the business sector and a potentially declining GDP.

8. Changes in the portfolio of orders for durable goods. The compression of the volume of the order portfolio indicates a reduction in aggregate demand and a subsequent decline in GDP.

9. Changes in prices for some types of raw materials. A decline in commodity prices often precedes a drop in GDP.

10. An offer of money. A reduction in the supply of money in accordance with the monetarist model is associated with a future decline in GDP.

11. Consumer Expectations index. The drop in consumer confidence, characterized by this index, portends a reduction in consumer spending and GDP.

If the weighted average index of leading indicators has been declining or growing for three consecutive months, then the economy as a whole will develop in the same direction. However, this index is not an impeccable barometer of the economic situation and does not guarantee absolute accuracy in conducting macroeconomic policy.

Another critical argument against discretionary policy is the possibility of opportunistic behavior by decision makers. They may, firstly, be incompetent, secondly, pursue their own interests to the detriment of public ones, and thirdly, pursue a policy aimed at preserving political power without caring about the economic consequences.

When studying empirical facts related to the cyclical behavior of the economy, many economists have drawn attention to the fact that most modern cycles, as a rule, were preceded by significant changes in the amount of money in circulation. Therefore, in a number of modern theories, monetary policy is often considered as a probable source of cyclical fluctuations. Some economists explain the frequent fluctuations in monetary policy by changing the political orientations of the elected supreme authorities. They claim that most politicians are trying to influence economic activity in the hope of gaining

popularity and securing a repeat victory in new elections. They have monetary policy in their arsenal, which implements the choice between inflation and unemployment as the main macroeconomic benchmarks (the Phillips curve). If unemployment is the main problem before the elections, then a stimulating monetary policy is carried out; if inflation is the policy of "expensive" money. Economic cycles arise due to the irrationality of voters and the opportunistic behavior of politicians. The influence of political cycles on the development of the economy was discussed in more detail in the course of microeconomics.

Advantages of a hard-line policy

The experience of macroeconomic regulation in developed countries shows that a firm course of government policy, "playing by the rules" has advantages over arbitrary policy.

1. Consistent macroeconomic policy reduces the risk of making incompetent decisions.

Incompetence in economic policy may be associated not so much with the incompetence of specific officials, but with the following two circumstances:

– an incompetent decision of the government may arise spontaneously as a result of a clash of conflicting interests of various social groups;

– the imperfection of information creates conditions for the actions of amateurs who offer tempting, but not realistic enough programs for the rapid resolution of complex macroeconomic problems.

With firm policies of the government and the National Bank, the risks of making incompetent decisions under the pressure of certain social obligations are reduced.

2. The policy of a firm course reduces the influence of the political business cycle on the dynamics of employment, output and inflation.

The firm policy courses of the government and the National Bank make it possible to relatively protect the economy from the influence of changes in the political conjuncture. Adherence to a firm course reduces the possibility of fiscal and monetary maneuvers of the government in the short term, but contributes to the stabilization of the economy in the long term.

3. "Playing by the rules" helps to strengthen the confidence of economic agents in the policies of the government and the National Bank.

The problem of distrust is connected with the possible refusals of the government and the National Bank from their promises to carry out certain economic measures. Business entities know that the government can break its promises, and are insured against fraud – they do not invest and do not expand production. As a result, the economy as a whole loses significantly, because

the incentives for economic growth are blocked by pessimistic expectations. Being aware of the inconsistency of macroeconomic policy, the subjects cease to trust the statements of the government and the National Bank, and the economy may turn out to be unmanageable. The policy of a firm course, which is not accompanied by any promises, causes business entities to have more confidence, makes expectations more rational and creates a more favorable environment in terms of long-term economic growth goals.

Types of anti-inflationary policy

The negative social and economic consequences of inflation and unemployment force governments of different countries to pursue certain economic policies – expansion or containment.

The essence of the expansion policy is that the state seeks to increase aggregate demand by increasing government spending or reducing taxes.

The growth of government spending increases the purchasing power in the economy, and consequently, the total volume of demand, which in turn leads to an increase in production volumes. Tax cuts operate in the same way in principle.

It is possible to influence aggregate demand by stimulating investment, for example, by lowering the interest rate, which makes credit for expanding production cheaper.

The policy of containment, or restrictive policy, is aimed at reducing the purchasing power of the population by cutting government spending or raising taxes. It may also include an increase in interest in order to deter investment, thereby reducing the total volume of aggregate demand.

The policy of expansion in conditions of inflation

Stimulating demand in accordance with Keynesian recommendations does not reduce unemployment in the long term. Expansion gives only short-term effects in the field of employment, and then at the cost of a constant increase in the rate of inflation.

The increase in demand during the policy of expansion provides only a temporary increase in production. At the beginning of the expansion of demand, employment and production increase, which increases inflation. A higher rate of price growth gives impetus to the inflationary process, in which expectations of future inflation and demands for higher wages increase the costs of the enterprise. This means that the aggregated supply curve moves up in the same way as the Phillips curve when inflationary expectations increase (fig. 7.9, *a*).

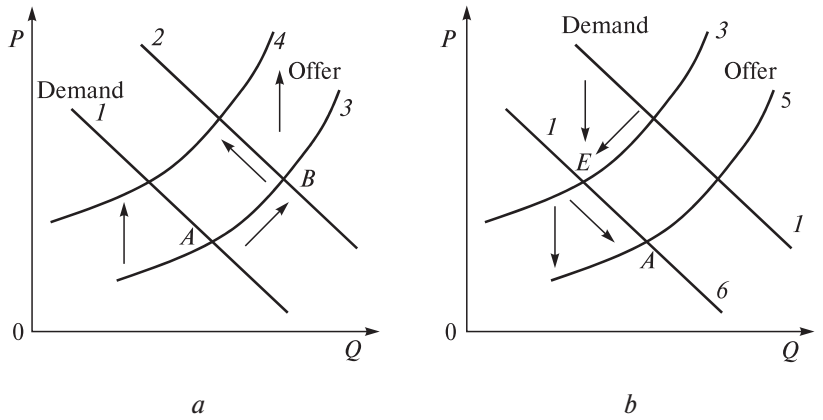

Fig. 7.9. Policy of expansion (*a*)
and containment (*b*) in the conditions of inflation:
1 – demand; *2* – demand after expansion; *3* – supply;
4 – supply after increased inflation expectations;
5 – supply after weakening inflation expectations;
6 – demand after containment by the level

Let's assume that the economy is at point *A*. An increase in demand will cause both an increase in employment and an increase in inflation. If the economy moves to point B, after a while there will be an expectation of future inflation, in connection with which the demands for wage increases will increase.

Increased costs move up the supply curve. As a result, when enterprises and employees adapt to inflation and make the same decisions again as before inflation, the economy will move to a new level of employment and production. However, now inflation will be higher. It will reach point *D*. This means that the aggregated supply curve moves up in the same way as the Phillips curve itself when inflationary expectations increase.

Thus, the policy of expansion does not have a long-term positive impact on employment or production. Considered over a long period of time, the supply curve, like the Phillips curve, has the shape of a vertical line. It follows from this that this policy can give a temporary positive effect, but it does not allow for a long time to reduce unemployment below the natural level or expand production beyond the limits determined by this.

In order to achieve a sustainable positive impact on employment and production, one should strive to improve the functioning of the economy by pursuing a targeted anti-inflationary and employment policy.

The policy of containment in the context of inflation

In the modern economy, both unemployment and inflation are present at the same time. The policy of expansion gives short-term effects in the sphere of production and employment, but in the long term it brings only a higher rate of inflation. At the same time, the restriction of demand leads to an increase in unemployment, a decrease in activity in the economy. This, without a doubt, ensures a reduction in inflation, but the "price" of this process – a reduction in production – may be high. The slower prices and wages decline, the longer high unemployment will persist and the higher the "price" of the containment policy will be.

During the policy of expansion, prices and inflation expectations increase rapidly, which has a positive effect on employment, but gives only a short-term effect. In the context of a policy of limiting demand, adaptation, on the contrary, is accompanied by increased unemployment. It takes time before prices and wages come into line with each other.

An important task of stabilization policy is to try to break inflation without causing an increase in unemployment. This means that it is necessary to look for ways to avoid long-term movements to higher levels of unemployment. Optimal solutions should be sought.

Let's assume that the economy is at point *D* (fig. 7.9, *b*). Restrictive policy, which reduces aggregate demand, entails an increase in unemployment and a decrease in inflation. The economy is moving to point *E*. Subsequently, inflation expectations weaken. The demands for higher wages and costs are decreasing, while the supply curve is shifting downward. If there is a complete adaptation of inflation expectations and enterprises make the same decisions as before the containment policy, the economy will return to the previous level of employment and production. The problem is that the transition period from *D* to *A* can be long. In this case, restrictive policies eventually lead to high costs – unemployment and a drop in production.

When the government believes that inflation is caused by excessive demand, it can choose one or more ways to influence the economy in order to reduce aggregate demand:

– fiscal (fiscal) policy, i.e. the policy of increasing taxes and reducing government spending;

– monetary (monetary) policy, i.e. the policy of limiting the money supply in circulation.

Offer policy

Restrictive policies, of course, can reduce the rate of inflation, but only at the cost of unemployment. There is a danger that such unemployment will be extensive and long-term if markets are not flexible enough. At the same time, the policy of expansion provides only a short-term positive impact on production and employment, but leads to a steady increase in the rate of inflation.

Fiscal and monetary policy alone, which affects demand, is not enough. Most economists have come to the conclusion that the policy of demand should be complemented by the impact on supply.

The essence of the supply policy is as follows: if, with the help of various economic policy measures, the supply curve could be moved down from the AS_1 position to the AS_2 position (fig. 7.10), then it would be possible to simultaneously reduce inflation and expand production. Inflation may decrease from P_1 to P_2, while the level of production may increase from Q_1 to Q_2.

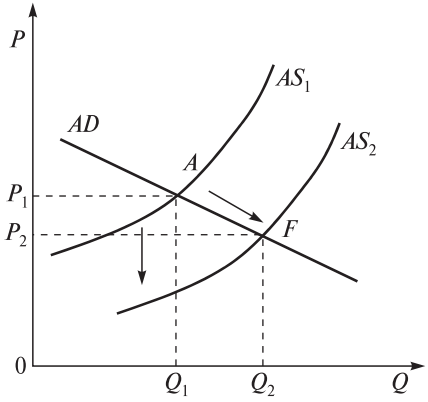

Fig. 7.10. The impact of economic policy on supply

One way to solve the problem of excessive demand would be to increase the supply of goods and services, but in a short period of time this may prove difficult. However, the government could improve production efficiency by:

– reduction of income taxes, which allows to reduce production costs and thereby move the supply curve down;

– impact on wages and curbing the growth of labor costs;

– improving the training and retraining of the workforce to give it mobility;

– providing subsidies to encourage investment and purchase more modern equipment;

– horizontal integration where it would lead to a scale effect;

– improving the system of roads and railways.

Active and adaptive anti-inflationary policy

Anti-inflationary policy is divided into active and adaptive.

An active policy is aimed at eliminating the causes that caused inflation.

Adaptive policy is an adaptation to the conditions of inflation, mitigation of its negative consequences.

The main levers of controlling inflationary processes are in the hands of the state, since it is the state that is responsible for the money supply and, accordingly, the amount of money supply.

The government has at its disposal a whole set of direct monetary levers that help to stop and contain inflation. These include: control over the money issue; prevention of emission financing of the state budget; current control of the money supply through operations on the open market; suppression of the circulation of money surrogates; finally, the implementation of monetary reform of the confiscation type.

The effectiveness of the first four listed methods can be ensured only if inflation is contained or prevented. In conditions of hyperinflation, the only way out is monetary reform.

Anti-inflationary policy can be successful only if it is aimed at eliminating not only the manifestations of inflation (monetary reform), but also the causes that generate and support it.

In accordance with the inflation mechanisms discussed above, anti-inflationary measures are classified depending on what kind of inflation they are aimed at combating.

Measures against demand inflation: reduction of government spending; increase in taxes; reduction of the state budget deficit; transition to a tight monetary policy; stabilization of the exchange rate by fixing it.

Measures against demand inflation ultimately come down to curbing aggregate demand. The economy, which has a high inflation rate, is experiencing these changes very painfully: the reduction in aggregate demand is accompanied by a recession and an increase in unemployment. However, the stabilization of the economy creates good prerequisites for effective development.

Measures against cost inflation are quite diverse: curbing the growth of factor incomes and prices; combating monopolism in the economy and developing market institutions; stimulating production within the “supply economy”.

The policy directed against factor incomes and at the same time price growth, the so-called policy of price and income containment, can be implemented by various means: freezing prices and wages, indirectly limiting their growth.

Rigid restraint of prices and incomes gives unambiguously visible fruits in a fairly short period of time. However, the price of such deflation is quite high, since at the same time market mechanisms of economic stabilization are "restrained", imbalances and inflation expectations are frozen.

The indirect restriction provides for either the establishment of a triple agreement "state –entrepreneurs–trade unions", or the introduction of additional taxes on income and price growth.

It is necessary to highlight measures aimed at stimulating production within the framework of the "supply economy". The essence of this concept boils down to the fact that the government should take measures to shift the long-term curve of aggregate supply, i.e. increase the level of natural output. Then the short-term *AS* curve will naturally shift to the right without moving up.

The main elements of the "supply economy" policy should include: reduction of taxes; development of competition in the infrastructure sector; strengthening of labor migration of the population through changes in social policy; monetary emission strictly within the expected increase in the natural level of output. Adaptive policy is based on the fact that all subjects of the market economy (households, firms, the state) take into account inflation in their actions primarily by taking into account losses from a decrease in the purchasing power of money.

This policy includes indexation; agreements with entrepreneurs and trade unions on the growth rates of prices and wages. Indexation, i.e. the change in nominal cash payments, is of serious importance for mitigating the effects of inflation only for the reason that it applies to recipients of fixed incomes, i.e. those who lose the most from inflation. In addition, if the indexation is sufficiently linked to the rate of inflation, it can also put downward pressure on inflation expectations.

Employment policy

The aim of such a policy is to increase the efficiency of labor markets so that at any given level of aggregate demand, the unemployment rate would be minimal. There are four main directions of state regulation of the labor market. Firstly, these are programs to stimulate employment growth and increase the number of jobs; secondly, programs aimed at training and retraining of the workforce, and thirdly, programs to promote the hiring of labor. And finally, unemployment social insurance programs.

The state has the opportunity to increase the total amount of spending on goods and services in order to create new jobs. At the same time, it should be noted that if an increase in expenses causes an increase in prices and wages, this will have little effect on the level of employment.

Most of the difference in increased demand goes to compensate for higher prices and wages, and not to increase production. Therefore, the government is reluctant to increase demand because of the danger of inflation.

Another problem arises: a fairly large share of consumer spending goes to the import of goods and services. This means that jobs are being created not at home, but abroad.

Many economists believe that income regulation measures should become an integral part of any policy: this will reduce the unemployment rate. If the growth of wages and other incomes is not somehow limited, an increase in general demand will entail an increase in wages and prices rather than the creation of new jobs.

The vocational training program allows workers to get a job as quickly as possible. Various government programs provide training for the unemployed, young people, as well as older workers whose skills have proved insufficient or outdated over time, both in the workplace and in special educational institutions.

The Labor Force Recruitment Assistance program is associated with providing high-quality information about the availability of jobs coming from potential employers. This program is also related to ensuring the geographical migration of workers.

One of the directions of employment policy is *social protection* of the unemployed. It will have a real effect if it is based on the real capabilities of the economy, the acceleration of inflation and the increase in institutional unemployment will be excluded.

State social assistance should be selective and distributed depending on which group of unemployed the applicant belongs to. For example, a voluntarily unemployed person who has made an informed choice, despite all the efforts of the state to employ him, should not be supported at the expense of funds intended for the payment of unemployment benefits.

In addition to these areas of employment policy, there is *indirect regulation of the labor market*: tax, monetary and depreciation policy of the government. Legislation on social security, labor relations, equal civil rights, etc. also has a considerable impact on the labor market.

Measures of indirect regulation of the labor market are simultaneously measures of general economic regulation and affect the dynamics of employment and unemployment by influencing the economic situation in the country.

QUESTIONS

1. What are the reasons for the cyclical development of the economy and what are the indicators characterizing the economic cycle?
2. What characteristic corresponds to the main parameters of the economic cycle?
3. What is the characteristic of a two-phase business cycle model?
4. What is the characteristic of the four-phase model of economic cycle?
5. How are the main macroeconomic models of the business cycle characterized?
6. What is unemployment as an economic phenomenon? What are the reasons for unemployment?
7. What are the main types of unemployment you know? Describe each species with an appropriate example.
8. What is the natural rate of unemployment?
9. Should full employment of the population be considered 100 % employment in the economy?
10. How is the unemployment rate calculated?
11. What social and economic consequences of unemployment can you name?
12. What are the main activities carried out by the state in the fight against unemployment?
13. How is the Fisher equation characterized?
14. What is the essence of Okun's law?
15. What is inflation as an economic phenomenon?
16. What are the causes and types of inflation?
17. What indicators are used to measure inflation?
18. What are the main types of costs of inflation? Give examples for each type of cost.
19. What social and economic consequences of inflation are you familiar with?
20. Are inflationary processes always negative for the economy?
21. Is it possible for inflationary processes to occur under conditions of barter exchange?
22. What is the characteristic of adaptive and rational expectations in the economy?
23. What are the main measures taken by the state in the fight against inflation?

8. GENERAL ECONOMIC BALANCE

Basic concepts
Dual equilibrium model. Commodity market. Money market. Price level. Interest rates. Level of real output. Fiscal policy. Monetary policy. Offer. The law of supply. Non-price factors of the offer. Classical dichotomy.

8.1. COMBINING MARKETS FOR GOODS AND SERVICES, MONEY AND THE LABOR MARKET WITH FLEXIBLE REAL WAGES. ACCOUNTING FOR THE PRICE LEVEL. DETERMINATION OF OUTPUT, INTEREST RATES AND PRICES UNDER CONDITIONS OF GENERAL EQUILIBRIUM

For a deeper study of the mechanisms of action of fiscal and monetary policy, the *IS–LM* model proposed by the English economist J. Hicks. It is also called the dual equilibrium model, since it defines the conditions under which simultaneous equilibrium occurs in the commodity and money markets. The model makes it possible to understand how fiscal and monetary policies affect the economy, how they are interconnected, and what are the consequences of their implementation.

J. Hicks was a follower of J. M. Keynes, so his model is based on Keynesian theoretical positions. When it is constructed, it is assumed that the price level is unchanged; there are free production capacities in the economy; there is a reserve of labor; the national volume of production is equal to the total income of society. To study the model, let's first consider the equilibrium in the commodity and money markets.

Commodity market

It is known that there is an inverse relationship between the level of the real interest rate i (in conditions of price immutability, the nominal interest rate i is equal to the real r. Therefore, in order for the model to have the same designations in all charts, we will denote the real interest rate also through i) and planned investments I. This dependence is reflected in fig. 8.1, a. At the interest rate level i, the volume of planned investments will be I_1. Accordingly, the aggregate demand of AD (fig. 8.1, II) will be equal to $C + I_1 + G + H_p$. The aggregate demand curve, intersecting with the bisector, will determine the equilibrium point E_1 and the equilibrium volume of income Y_1. Thus, with an

interest rate of i_1, the income of Y_1 will be in equilibrium. These parameters will determine point A (fig. 8.1, II).

Let's assume that the interest rate has decreased from i_1 to i_2. This will lead to an increase in planned investments I_1 to I_2 and an increase in aggregate demand. The aggregate demand curve will move up to the position $C + I_1 + G + X_n$ (fig. 8.1, II). The new equilibrium position in the commodity market will be reached at point E_2, and the equilibrium will be income Y_2. Since investments have a multiplier effect, it is possible to determine the increase in income by multiplying the increase in investment by a multiplier. In fig. 8.1, in the values of i_2, Y_2, the point B will correspond.

If we continuously change the values of the interest rate and find the corresponding values of income (output) for each, then we get the curve *IS* on the graph (fig. 8.1, III). Each point of it expresses a combination of i and Y at which equilibrium occurs in the commodity market.

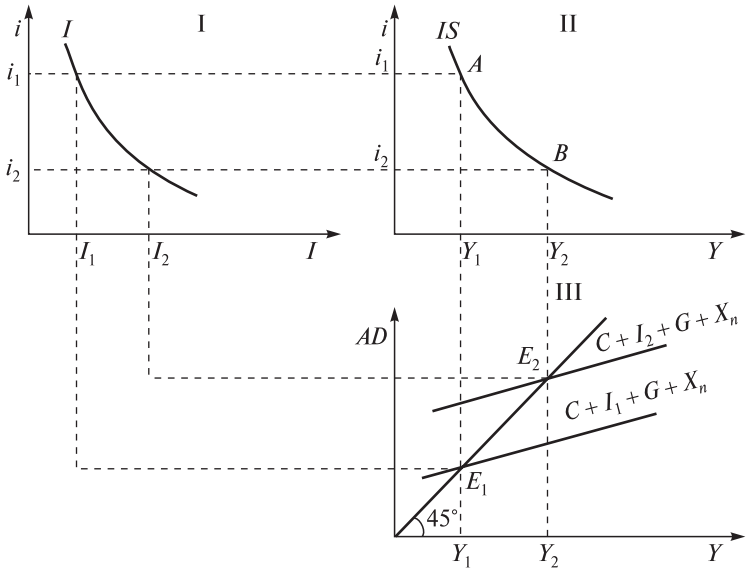

Fig. 8.1. Equilibrium in the commodity market. The *IS* curve

The *IS* curve has a downward form, which is explained by the inverse relationship between the interest rate level and the amount of aggregate demand. The output volume always tends to reach some point on the *IS* curve, because only at such points will the commodity market be in equilibrium. All points lying outside the *IS* curve give a non-equilibrium state of the commodity

market. So, if the economy is described by a point lying to the right of the *IS* curve, then it is characterized by an oversupply of goods. If the economy corresponds to the point lying to the left of the *IS* curve, it means that there is excessive demand for goods.

Shifts of the *IS* curve

The IS curve shows the relationship between the interest rate i and the level of income (output). Therefore, when the interest rate changes, the income level will change and the point will move along the *IS* curve.

There are factors whose changes will lead to a shift in the *IS* curve. Consider the effect of changes in autonomous consumer spending on the position of the *IS* curve. Suppose that initially, with the interest rate i_1 and a fixed level I, G and C_p, the aggregate demand was $C_1 + I + G + C_p$, and the equilibrium income level was Y_1 (fig. 8.2, *a*). Under these conditions, the IS_1 curve was constructed (fig. 8.2, *b*).

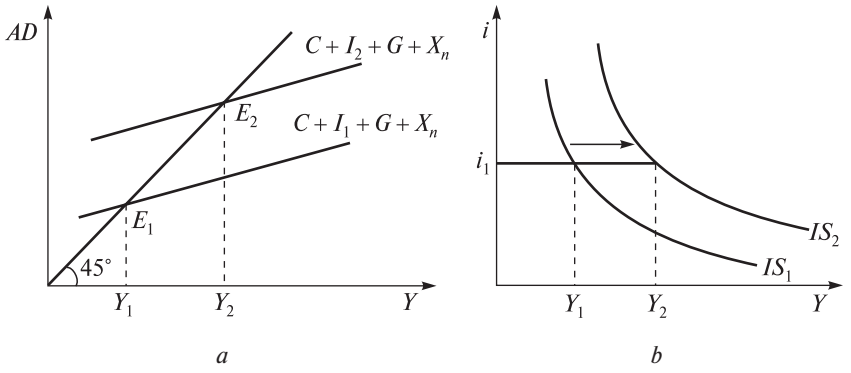

Fig. 8.2. Shifts of the *IS* curve

Let's assume that at the previous interest rate i_1, consumer spending increased. This will lead to an increase in aggregate demand from $C_1 + I + G + H_p$ to $C_2 + I + G + H_p$. The aggregate demand curve will move up to the position $C_1 + I + G + C_p$. The equilibrium income increased from Y_1 to Y_2. This increase in income in the lower graph is shown by shifting the IS_1 curve to the IS_2 position, i.e. to the right.

The reduction of autonomous consumer spending will lead to a decrease in aggregate demand and a decrease in the equilibrium level of income. The *IS* curve will shift to the left.

The position of the *IS* curve is also affected by changes in investment demand that are not related to changes in the interest rate. For example, entrepreneurs, for some reason, expect an increase in the profitability of investments. Ego will lead to an increase in planned investments and a shift in the *IS* curve to the right, since the latter are the same element of aggregate demand as consumer spending. A decrease in planned investments at any value of the interest rate will lead to a shift of the *IS* curve to the left.

An increase in government spending and a reduction in taxes will cause the *IS* curve to shift to the right. They will contribute to the growth of aggregate demand, and hence income (output). Accordingly, a reduction in government spending and an increase in taxes will lead to a decrease in aggregate demand, a shift in its downward curve and a decrease in the equilibrium income level. The IS curve will shift to the left in such cases.

Money market

Let's say income Y_1 is generated. Its volume determines the demand for MD_1 money. If the money supply is *MS*, then the money market will be in equilibrium at point E_1 (fig. 8.3, *a*).

Therefore, with income Y_1, the money market will be in equilibrium at the interest rate i_1. The values of Y_1, i_1 are determined in fig. 8.3, *b* by point *A*.

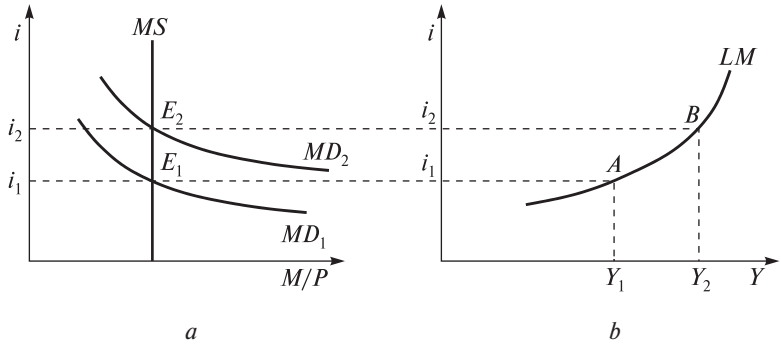

Fig. 8.3. The equilibrium of the money market. *LM* curve

With income Y_2, the demand for money will increase to MD_2 and the money market will be in equilibrium when the interest rate is equal to i_2. The values of Y_2 and i_2 determine point *B* on the graph. By continuously changing the volume of income (output), it is possible to determine the set of interest rates at which the money market will be in equilibrium, and construct the *LM*

curve (fig. 8.3, *b*). Each point of the curve shows a combination of *i* and *Y* at which the money market is in balance.

The *LM* curve has an ascending form, which is explained by the direct relationship between *i* and *Y*.

All points lying outside the *LM* curve give a non-equilibrium state of the money market. The points located to the left of the *LM* curve correspond to the state of the economy when the supply of money exceeds demand. If the economy is described by a point lying to the right of the *LM* curve, then it is characterized by excessive demand for money.

Shifts of the *LM* curve

When the interest rate changes, the point moves along the *LM* curve. Thus, an increase in the rate from i_1 to i_2 shifts point *A* to the position of point *B* (see fig. 8.3, *b*). The curve itself shifts when the supply of money and the autonomous demand for money change. Let's show it.

Let's assume that with income Y_1, the demand for money was at the level of *MD*, the supply of money was MS_1. The market was in equilibrium at point E_1 at the interest rate i_1 (fig. 8.4, *a*).

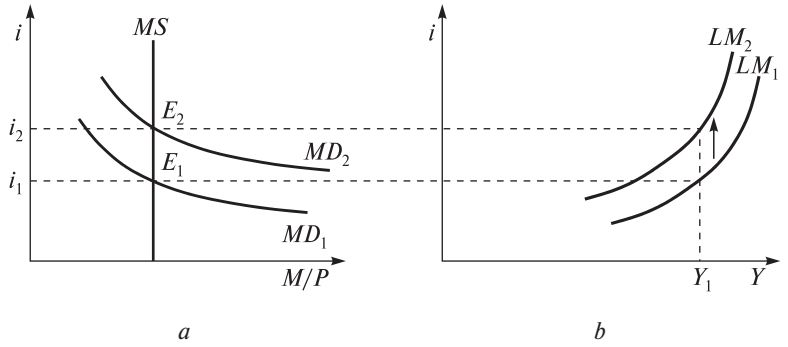

Fig. 8.4. Shifts of the *LM* curve: change in the money supply

With this *MS* money supply, the LM_1 curve was constructed (fig. 8.4, *b*). Suppose the central bank, pursuing an anti-crisis policy, increased the money supply, which caused the MS_1 curve to shift to the MS_2 position (see fig. 8.4, *a*). With the income level Y_1 and the constant demand for money *MD*, an increase in the supply of money will lead to the fact that the equilibrium of the money market will occur at a lower interest rate i_2. This will cause the LM_1 curve to shift downwards to the LM_2 position (see fig. 8.4 *b*). Accordingly, a decrease

in the supply of money at a given level of income and demand for money will lead to an increase in the equilibrium interest rate and an upward shift of the LM_1 curve.

The *LM* curve can also shift under the influence of changes in autonomous demand for money (changes caused by exogenous factors, and not due to changes in the price level, real income (output) or interest rate). Let's assume that the money market is in equilibrium at point E_1 at the equilibrium interest rate i_1 (fig. 8.5, *a*).

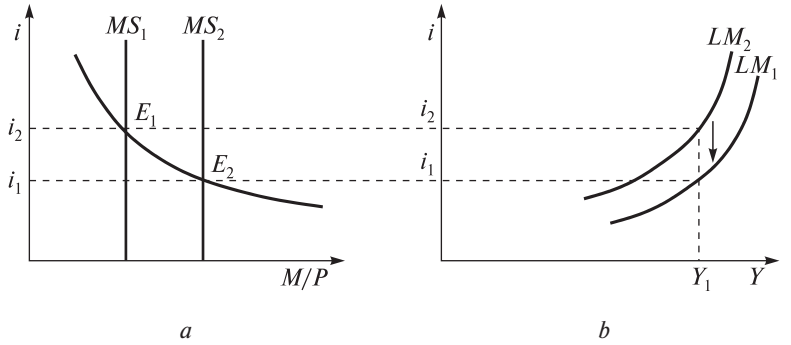

Fig. 8.5. Shifts of the *LM* curve: changes in autonomous demand for money

Corresponding to these conditions is the LM_1 curve (fig. 8.5, *b*). Financial panic led to the fact that the riskiness of investments in securities increased and the demand for them decreased, which led to an increase in demand for money at any given values of the interest rate, price level and real income. The MD_1 demand curve has moved up to the MD_2 position. A new equilibrium in the money market with an unchanged issue of Y_1 will be observed at a higher interest rate of i_2 (see fig. 8.5, *a*). The equilibrium point will shift from position E_1 to position E_2. This will cause the LM_1 curve to shift upwards to the LM_2 position (see fig. 8.5, *b*). With a reduction in the autonomous demand for money, the LM_2 curve will move down.

Graphic representation of the *IS–LM* model

The *IS* curve reflects all combinations of *Y* and *i* at which the commodity market is in equilibrium. The *LM* curve is all combinations of *Y* and *i* that ensure the equilibrium of the money market. To determine the general equilibrium in the commodity and money markets, it is necessary to combine both curves on one chart (fig. 8.6).

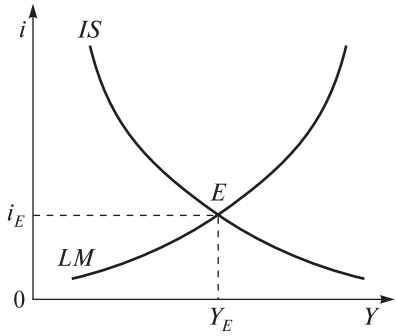

Fig. 8.6. Model *IS–LM*

Point *E* is the only one in which both markets will be in equilibrium.

Fiscal policy in the *IS–LM* model

Suppose that initially the general equilibrium in the markets of goods and money was reached at the point *E* at the interest rate i_E and income I_E (fig. 8.7).

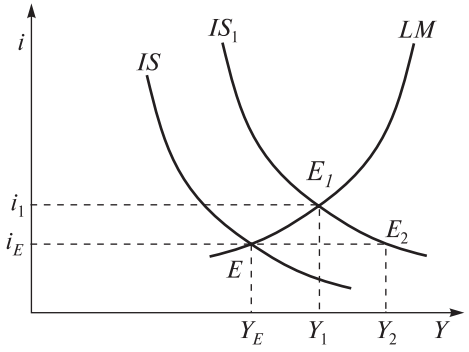

Fig. 8.7. Fiscal policy in the *IS–LM* model

The economic situation in the country required a stimulating fiscal policy. The Government has decided to increase public spending by ΔG. The growth of government spending has led to an increase in aggregate demand, and consequently, income. The curve *IS* shifted to the right, to the position IS_1. If the i_E interest rate had remained the same, then a new equilibrium position

would have been reached at point E_2, and income would have increased by an amount equal to Y_2. However, it does not remain unchanged. An increase in income leads to an increase in aggregate demand and an increase in demand for money.

In conditions of a constant supply of money, the demand for money begins to exceed their supply, which leads to an increase in the interest rate. In the commodity market, the growth of aggregate demand encourages entrepreneurs to increase investments. However, an increase in the interest rate begins to restrain this process, forcing them to reduce the planned increase in investment at the iE interest rate. Consumer demand for durable goods is also decreasing. The interest rate continues to rise to the i1 level, at which the commodity and money markets reach equilibrium. The new equilibrium point is E_1, and the equilibrium level of income (output) is Y_1. Therefore, the actual increase in output is $Y_1 - Y_E$. It can be calculated as the product of ΔG by the value of the new multiplier, which is smaller than the simple Keynes multiplier M_G.

Restraining fiscal policy generates the opposite effect. It causes a reduction in aggregate demand and leads to a shift of the *IS* curve to the left. The aggregate output decreases, and the interest rate decreases.

Monetary policy in the *IS–LM* model

Suppose the equilibrium in the commodity and money markets was observed at point *E*. The equilibrium output volume was Y_E, and the equilibrium interest rate was i_E (fig. 8.8).

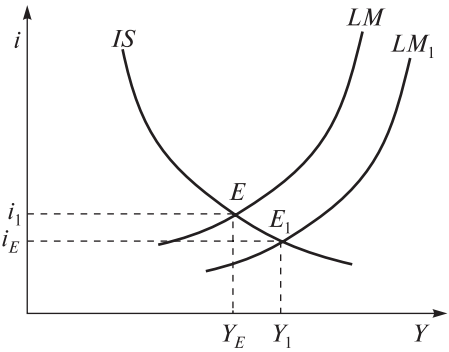

Fig. 8.8. Monetary policy in the *IS–LM* model

Thus, the *IS–LM* model shows that an increase in government spending causes both an increase in output from Y_E to Y_1 and an increase in the interest

rate from i_E to i_1. At the same time, output increases to a lesser extent than expected, since an increase in the interest rate reduces the multiplier effect of government spending: an increase in government spending (as well as an increase in other budget expenditures, tax cuts) partially displaces planned private investment. This phenomenon is called the ***displacement effect***. It reduces the effectiveness of expansionary (stimulating) fiscal policy. It is to him that monetarists refer, arguing that fiscal policy is not effective enough and priority in macroeconomic regulation should be given to monetary policy.

In an effort to increase aggregate demand, the central bank increased the supply of money, which led to a shift of the *LM* curve to the right, to the position of LM_1. In the money market, supply exceeds demand, which leads to a decrease in the interest rate. Its decline causes an increase in investment and net exports. The aggregate demand for goods and services increases, which leads to an increase in income (output). The excess supply of money will disappear when the equilibrium is established at point E_1, since both a decrease in the interest rate and an increase in income cause an increase in demand for money. The latter will continue until it becomes equal to the new money supply. Consequently, expansionary monetary policy caused an increase in output from Y_E to Y_1 and a decrease in the interest rate from i1 to i_E.

As a result of restrictive monetary policy, on the contrary, the *LM* curve will shift to the left, the interest rate will increase, and output will increase.

Thus, the IS–LM model shows that changes in the money supply affect the equilibrium level of income (output). However, Keynes' followers argued that this influence is sometimes insignificant, for example, with interest rates close to the minimum. Extremely low interest rates lead to the fact that the population, banks do not want to buy bonds, but prefer to accumulate money, whatever their offer. In this case, the money demand curve is almost parallel to the abscissa axis, which means that the *LM* curve has an almost horizontal section at the beginning.

Let's assume that initially the markets of goods and money are in equilibrium at the intersection point of the curves *IS* and *LM* – the point *E* (fig. 8.9).

Suppose the supply of money has increased. This caused the *LM* curve to shift to the right, to the position LM_1. But since the curve has an almost horizontal section, this shift will not lead to any significant reduction in interest rates: the volume of investments and output will remain at the same level. Therefore, in this case, a change in the supply of money does not change the real output (income). This situation has been called a ***liquid trap***. Early followers of Keynes referred to it when they proved the ineffectiveness of monetary policy.

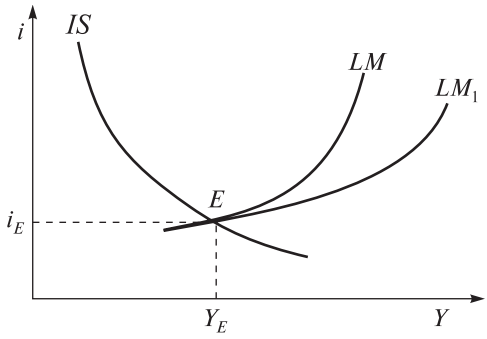

Fig. 8.9. Liquid trap

Monetarists have studied more deeply the impact of changes in the amount of money on the country's economy. They showed that monetary policy affects national income not only through the rate of interest and investment, as Keynesians believed, but also through the purchase of durable goods, changes in stock prices, and the volume of government purchases. Therefore, today almost all economists consider monetary policy to be an effective tool of macroeconomic regulation.

The price level and real output

What matters to people is what their money will buy, or its real value. Real money is independent of the price level but nominal money is held in proportion to the price level: the higher the price level the higher the quantity of nominal money demanded, other things being equal.

The demand for real money is affected by the size of real output: if real output rises then more goods and services are produced, and more buying and selling goes on. Both real aggregate income and real aggregate expenditure rise.

Real output primarily affects the transactions demand for money. Figure 8.10 illustrates the relationship between the two as the line MD_t, with real output on the horizontal axis and the amount of money held on the vertical axis.

The rate of interest

The rate of interest, or the opportunity cost of holding money, affects the speculative demand for money: if the rate of interest is high then the opportunity cost of holding money is high and less money is held in idle balances, other things being equal. The relationship between the speculative

demand for money and the rate of interest is shown in fig. 8.11. Notice that in this diagram the amount of money held is shown on the horizontal axis (unlike in fig. 8.10) and the rate of interest is on the vertical axis – the result is the downward- sloping demand curve MD_s, with price (the rate of interest) on the vertical axis and quantity on the horizontal axis.

How do we incorporate the other demands for real money, the transactions and precautionary demands? Neither are particularly sensitive to the rate of interest so will not much alter the slope of the speculative demand curve. At any one level of output there will be a money demand curve (MD_0) plotted against the rate of interest, as in fig. 8.12, and as real output rises this demand curve will shift rightwards to MD_1.

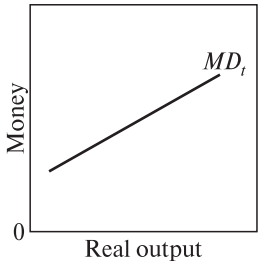

Fig. 8.10. The transactions demand for money is affected by the level of real output

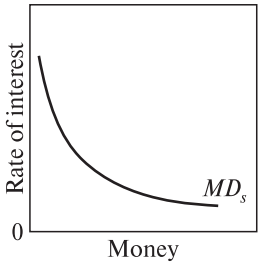

Fig. 8.11. The speculative demand for money is affected by the rate of interest

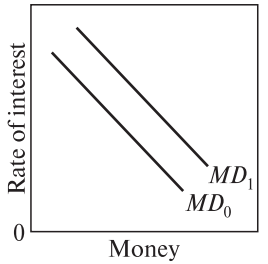

Fig. 8.12. The money demand curve shifts to the right as real output rises

What about the effect of changing prices? If 'nominal' is substituted for 'real' in all these diagrams they work just as well. The effect of rising prices is to increase the nominal demand for money at each rate of interest, so the money demand curve shifts to the right, from MD_0 to MD_1, as prices rise and money loses its value.

The next section puts the demand and supply of money together and shows how the rate of interest is determined; but first we consider interest rates in the real world.

The rate of interest is not the price of money; money is the medium of exchange and you cannot buy pounds with pounds. Nor is interest a payment for using money. It is rather the price paid for borrowing money or the reward for lending money. By paying interest on borrowed money people can use resources they have not yet earned enough to pay for. Having the use of resources now is generally worth more than the future use of those resources, so it can be worthwhile paying to borrow money.

Although we talk about the interest rate as if there were only one, in fact there is a family of interest rates, with different rates for different circumstances, all in operation at the same time. One of the main reasons for this variety of interest rates is that the income of banks and other financial institutions comes from charging a higher rate of interest to borrowers than they pay to depositors (savers). But there are other reasons too for the range of interest rates at any one time.

In March 1996 Barclaycard sent a notice to all its cardholders announcing that its monthly interest rate would be reduced from 1.63 per cent to 1.61 per cent. Rather a tiny change, you might think, but actually quite significant in terms of competition with other credit card companies and the amount of interest paid by more heavily indebted cardholders over several months. Most interest rates are quoted as annual rates and are therefore easy to compare, but here a monthly interest rate was quoted, which is much less frightening for thoughtless borrowers. Although this is normal for credit card companies, it also tends to mislead the less mathematically aware, who imagine that the annual rate is twelve times the monthly rate and do not realize that interest is compounded over the twelve months and that the actual rate is thus a higher figure than they think. Barclaycard's annual rate of interest in this case was reduced from 21.4 per cent to 21.1 per cent, while the rate at which commercial banks were lending to their most reliable large customers at this time was 7 per cent.

Credit card interest rates tend to be higher than most other interest rates, although the highest rates of all are charged by loan sharks, lending to the poor and desperate. One factor affecting the rate of interest charged is the degree of risk run by the lender that the borrower will not repay the money borrowed; credit card companies extend credit widely and therefore run quite a risk.

Another factor which may influence risk is the length of time over which the loan is being made. In general, a longer time period increases the risk of default and therefore the rate of interest payable.

A third element of risk faced by the lender is that the money may lose some of its value while the borrower is using it – not because money gets worn out, but because the price level may change and the money's purchasing power be less by the time the loan is repaid. This risk is obviously greater in inflationary times and when loans are made over a longer period. The lender needs to be compensated for the expected loss in value over the time period of the loan so interest rates are higher the higher the expected rate of inflation, and the best guide to the expected inflation rate is the current inflation rate.

Nominal interest rates are therefore affected by the inflation rate. The real interest rate reflects all influences, other than inflation, on the rate of interest. The real interest rate is the nominal interest rate minus the rate of inflation.

To summarize, the factors affecting the level of an interest rate are whether it is a borrowing or a lending rate, the risk of default, expected inflation, and the time period of the loan.

The rate of interest and money market equilibrium

The size of the money supply is controlled, more or less effectively, by a country's central bank – in Britain this is the Bank of England. The central bank actually tries to control the nominal money supply, which does not guarantee that it can control the real money supply. The relation between the two forms of money supply is as follows:

real money supply = (nominal money supply) / (price level).

To make our analysis easier, we will assume that there is no change in the price level, that is, that the nominal is the same as the real. Simple monetary theory holds that the supply of money is not influenced by the rate of interest but by institutional factors, briefly mentioned earlier in this chapter. Figure 8.13 illustrates this lack of a relationship between the rate of interest and the money supply. With the rate of interest on the vertical axis and the quantity of money on the horizontal axis, the money supply (*MS*) is shown as a vertical line.

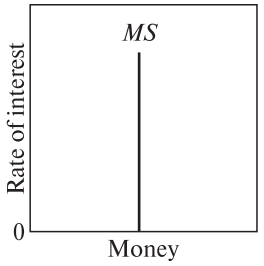

Fig. 8.13. The size of the money supply is not affected by the rate of interest

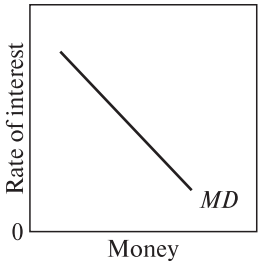

Fig. 8.14. The demand for money

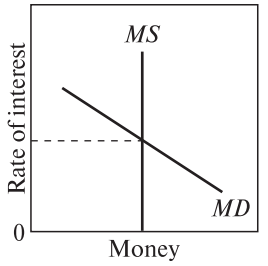

Fig. 8.15. Equilibrium in the money market

However, as described earlier in this chapter, the demand for money is affected by real output and the rate of interest. Using the same axes as fig. 8.13, fig. 8.14 shows the demand for jnoney (*MD*). To arrive at equilibrium in the money market, we put the demand for money and the supply of money together in fig. 8.15. Only at the rate of interest re are the demand and supply of money equal: it is only at the rate of interest re that the money market is in equilibrium.

Equilibrium in the money market is achieved by adjustments of the exchange rate and of the interest rate. The exchange rate is outside the scope of this part of the book and we focus here on the role of the interest rate.

Changes in the interest rate affect the speculative demand for money. At the equilibrium interest rate people want to hold money in just the same quantity as the money market supplies. If the rate of interest is higher people would rather hold less money and will, for example, buy more government bonds. This increased demand for bonds will drive up their price, which will have the effect of lowering the interest rate. There is an inverse relationship between the price of bonds and the rate of interest –one rises and the other falls. As the price of bonds rises they become less attractive, and holding money more attractive, until the interest rate is back to its equilibrium level.

This process will work the other way round too, of course. If the demand for money is greater than the supply people will sell bonds to acquire money; this will drive the price of bonds down and the rate of interest up, to the point where the demand and supply of money are again equal.

A shift in either the demand or the supply of money will have an effect on the rate of interest. The central bank may reduce the money supply either by selling government stock or by putting restrictions on the banks; figure 8.16 shows what happens. With a fall in the money supply, the money supply line MS_0 shifts to the left, to MS, and the equilibrium rate of interest rises from r_0 to r. This higher rate of interest is necessary to induce people to buy bonds rather than continuing to hold the same amount of money in idle balances. On the other hand, an increase in the supply of money would result in a fall in the equilibrium interest rate.

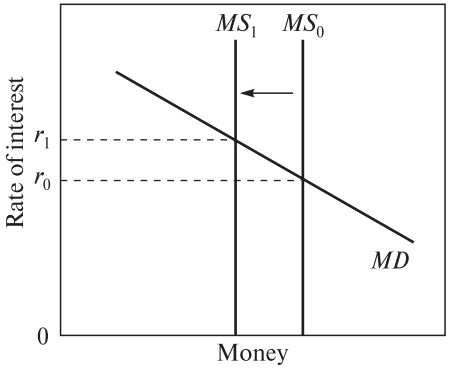

Fig. 8.16. A reduction in the money supply leads to a higher rate of interest

So far we have assumed a given level of output which has determined the position of the money demand line, MD_0. If output rises then people need more money to carry out transactions at each rate of interest - the demand for money rises; in fig. 8.17 the demand for money line MD_0 shifts rightwards to MD_1 and the equilibrium interest rate rises from r_0 to r. On the other hand, a fall in output with an unchanged money supply would lead to a leftwards shift of the money demand line and a fall in the rate of interest.

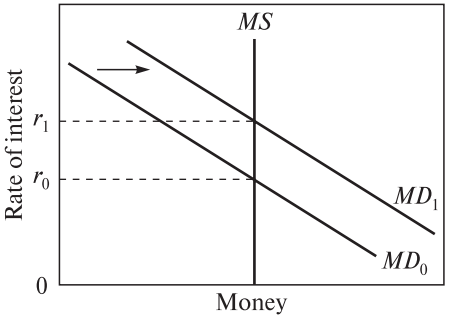

Fig. 8.17. An increase in the demand for money leads to a higher rate of interest

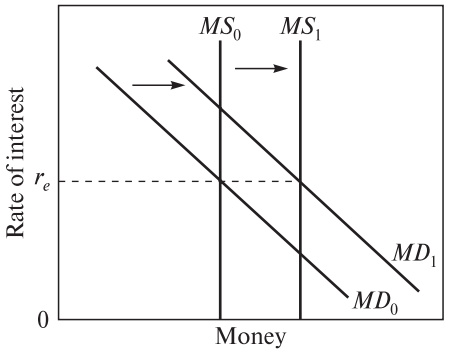

Fig. 8.18. An increase in both the demand and the supply of money may lead to no change in the rate

Finally, fig. 8.18 shows the utopian state of affairs in which output rises and the money supply increases sufficiently to maintain the same equilibrium rate of interest. After the rise in output the money demand line shifts rightwards

from MD_0 to MD_v the rise in the money supply is shown by the rightwards shift of the money supply line from MS_0 to MS, and the equilibrium rate of interest remains at r_e.

Utopia is all very well but in the real world things can be much more difficult. The next chapter continues to examine the role of money in the economy, building towards a discussion of monetary policy both as a tool for managing the economy in the short term and as a way of fostering longer-term stability and economic growth.

8.2. GENERAL BALANCE WITH FLEXIBLE PRICES. OFFER DETERMINED BY PROPOSAL. DICHOTOMY AND NEUTRALITY OF MONEY

Offer. The law of supply. Non-price factors of the offer

Commodity producers proceed from the needs of people and produce goods and services sold on the market. Consequently, the aggregate of commodity producers provides people with satisfaction of their effective demand, i.e. forms the supply. Supply is the desire and ability of producers (sellers) to provide goods for sale on the market at every possible price at any given time. The ability to provide goods is associated with the use of limited resources, so this ability is not so great as to satisfy all the needs of all people, because the aggregate needs, as we know, are limitless.

The volume of supply depends on the volume of production, but these two values do not always coincide. The value of the supply is not identical to the volume of products produced, since usually part of the products produced is consumed within the enterprise (internal consumption) and is not provided to the market. On the other hand, there are various losses during transportation and storage of goods (for example, natural loss).

The quantity of goods that a firm wants to produce is influenced by many factors, the main of which are the following: the price of the product itself; the price of the resources used in the production of this good; the level of technology; the goals of the firm; the amount of taxes and subsidies; the expectations of producers. Thus, the offer is a function of many variables, but we are primarily interested in the nature of the relationship between the value of the offer and the price of the goods, while other factors that can affect the offer remain unchanged.

There is a positive (direct) relationship between the price and the quantity of the product offered: all other things being equal, the value of the offer increases with the price increase, and vice versa, the price decrease is accompanied,

all other things being equal, by a reduction in the volume of the offer. This specific relationship is called the law of supply.

The operation of the law of supply can be illustrated with the help of a supply graph (fig. 8.19).

The supply curve is a graphical expression of the relationship between the price of a product and the quantity of this product that manufacturers want to offer on the market. The supply curve has an ascending character, which is due to the action of the law of supply.

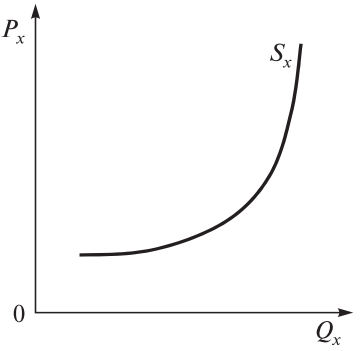

Fig. 8.19. The supply curve

Just as in the case of demand, there is a distinction between individual and market supply. Individual offer – the offer of a separate manufacturer. A market offer is a set of individual offers of a given product. The market supply is purely arithmetically, as the sum of the offers of a given product by different manufacturers at each possible price. The market supply schedule is determined by horizontal summation of individual supply schedules.

Non-price factors of the offer

The supply curve is constructed based on the assumption that all factors except the market price remain unchanged. It has already been indicated above that in addition to the price, many other factors affect the volume of supply. They were called non-price. Under the influence of a change in one of them, the supply values change at each price. In this case, they say that there is a change in the sentence. This manifests itself in the mixing of the supply curve to the right or to the left.

When the sentence expands, the curve S_0 shifts to the right and occupies the position S1, in the case of a narrowing of the sentence, the curve of the sentence will shift to the left to the position S_2 (fig. 8.20).

Among the main factors that can change the offer and shift the S curve to the right or left, the following can be distinguished (these factors are called non-price determinants of the offer).

1. Prices of resources used in the production of goods. The more an entrepreneur has to pay for labor, land, raw materials, energy, etc., the lower his profit and the less his desire to offer this product for sale. This means that with an increase in prices for the factors of production used, the supply of goods decreases, and a decrease in prices for resources, on the contrary, stimulates an increase in the quantity of goods offered at each price, and the supply increases.

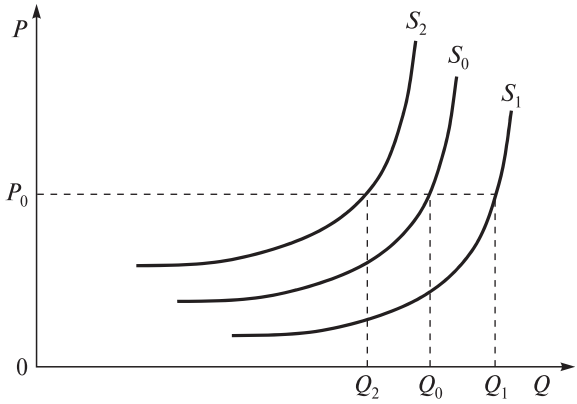

Fig. 8.20. The supply curve and non-price factors of supply

2. The level of technology. Any technological improvement, as a rule, leads to a reduction in resource costs (reduction of production costs) and is therefore accompanied by an expansion of the product supply.

3. The company's goals. The main goal of any company is profit maximization. However, firms can often pursue other goals, which affects the offer. For example, a firm's desire to produce goods without environmental pollution may lead to a decrease in the quantity of goods offered at every possible price.

4. Taxes and subsidies. Taxes affect the expenses of entrepreneurs. An increase in taxes means an increase in production costs for the company, and this, as a rule, causes a reduction in supply; a reduction in the tax burden usually has the opposite effect. Subsidies lead to lower production costs, so an increase in subsidies to business certainly stimulates the expansion of production, and the supply curve shifts to the right.

5. Prices for other goods may also affect the supply of this good. For example, a sharp increase in oil prices may lead to an increase in the supply of coal.

6. Manufacturers' expectations. Thus, manufacturers' expectations of a possible price increase (inflation expectations) have an ambiguous effect on the supply of goods. The offer is closely related to investments, and the latter are sensitive and, most importantly, difficult to predict react to market conditions. However, in a mature market economy, the expected rise in prices for many goods causes a revival of supply. Inflation in a crisis usually causes a decrease in production and a reduction in supply.

7. The number of producers (the degree of monopolization of the market). The more companies produce this product, the higher the supply of this product on the market. And vice versa. Just as in the case of the impact of

price and non-price factors on demand, a change in supply and a change in the value of supply are separated:

– a change in non-price factors leads to a shift in the supply schedule itself to the right or to the left, since in this case, manufacturers offer a different (greater or lesser) quantity of this product to the market at each price. Such changes in the offer can occur only in the case of changes in the non-price determinants of the offer. Here we are talking about changing the offer;

– whenever, as a result of some changes in the market situation, the value of the supply changes, and all the factors affecting it, except for the price of product *X*, remain unchanged, the supply curve for the product remains in the same place, there is a movement along the supply curve. In such cases, all other things being equal, the quantity of product *X* offered by manufacturers for sale changes. Here we are talking about changing the value of the offer.

8. Changes in supply and demand and their impact on the price. Market equilibrium. The market mechanism is a mechanism for the formation of prices and the allocation of resources, i.e. the interaction of market entities regarding the setting of prices, the volume of production and sale of goods and services. The main elements of the market mechanism are demand, supply, price and competition. The market is a mechanism of interaction between buyers and sellers, in other words, the ratio of supply and demand. When the interests of producers and consumers coincide, there is a market equilibrium. It can be defined as a situation when supply and demand coincide at a price acceptable to the consumer and the manufacturer. As a result of the interaction of supply and demand, an equilibrium price is established. It is fixed at the point where the supply and demand curves intersect. This point is called the equilibrium point, and the price corresponding to it is the equilibrium one (fig. 8.21).

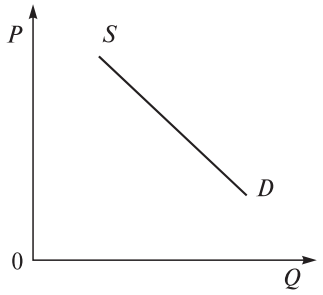

Fig. 8.21. Equilibrium of supply and demand

If the market price is lower than the equilibrium price, then there is a shortage of goods. When the market price is higher than the equilibrium price, an excess of goods is formed, in which the volume of supply exceeds the volume of demand.

9. Organization (firm) as an economic entity. The essence, goals and types of firms (enterprises). An enterprise (organization, firm) is an independent business entity that has the rights of a legal entity, which, based on the use of property by the labor collective, produces and sells products, performs work, and provides services.

The enterprise, regardless of the form of ownership of the means of production and other property, operates on the principles of economic calculation.

An ordered set of enterprises and their associations forms a single economic complex of the country. In a market economy, an enterprise independently plans the main directions and conditions of its activities, disposes of labor, material and financial resources. It chooses business partners by itself, enters into contractual relations with them, organizes foreign economic activity by itself. Organizational forms of management are also determined by the enterprise itself. It is free to choose the types of economic activity and implements the latter within the framework of existing legislation. The company itself determines the organizational structure, management structure, staffing.

10. The concept and classification of costs. Scale effects. ***Variable costs*** vary directly depending on the volume of production. They are associated with the costs of purchasing raw materials and labor. ***Fixed costs*** are expenses that remain unchanged, regardless of the quantity of products produced. These include rental of premises, equipment costs, payment of managerial and administrative staff, payment of bond loans, insurance premiums, some of which are mandatory, payment of collateral, etc. ***Obvious*** costs are cash payments to suppliers of factors of production. The obvious costs include: wages of workers and employees; expenses for raw materials and materials, commission fees to trading firms; contributions to banks and other financial institutions; payments for legal advice; transportation services, etc. Non–refundable costs are one-time costs. Non-refundable costs include, for example, the cost of making a sign with the name of the company. The category "cost price" is used, which refers to the direct costs of the enterprise for the production and sale of products. The ***cost price*** includes such costs that are taken into account when determining taxable profit (income). The cost price includes: material costs; labor costs; overhead costs; depreciation charges, etc. ***Cost minimization*** is a condition for maximizing profits – the difference between minimizing costs and maximizing profits is as follows when achieving the optimal combination of factors for any volume of output, factor prices and their marginal productivity are taken into account.

11. Income and profit of the company. Profitability. The end result of the activity of a commercial organization is profit. Profit is a cash-denominated net income that represents the difference between total income and total costs. The company makes a profit if the revenue from sales exceeds the cost of products sold (works, services).

Income is the most important economic indicator of works, enterprises (firms), reflecting their financial income from all types of activities, the end

result of which is the products produced and sold (services rendered, work performed), paid for by the customer.

Profit is the excess of expenses by income. The reverse position is called a loss.

To assess the efficiency of an industrial enterprise, it is not enough to use only the profit indicator. For example, two enterprises receive the same profit, but have different values of production assets, i.e. the amount of fixed capital and working capital. The enterprise that has a lower cost of production assets works more efficiently. Thus, in order to assess the efficiency of the enterprise, it is necessary to compare the profit and the production funds with which it was created. This is profitability.

Profitability – profitability, profitability of the enterprise; an indicator of the economic efficiency of the production of an industrial enterprise, which reflects the final results of economic activity.

Increasing the profitability of the enterprise contributes to an increase in profits based on the growth of production and sales of products, reducing its cost, better use of machinery and equipment, economical consumption of raw materials and materials, preventing unjustified expenses, reducing losses and downtime, increasing labor productivity.

12. The labor market, its essence and features. Nominal and real wages. The sphere of labor is an important and multifaceted area of the economic and social life of society. It covers both the labor market and its direct use in social production. The labor market, or as it is also called, the labor market, has a fundamental feature – its components are directly living people who not only act as carriers of labor, but are also endowed with specific features: psychophysiology, social, cultural, religious, political, etc. These features have a significant impact on the motivation and degree of labor activity of people and affect the state of the labor market as a whole. The labor market is a mechanism for making contacts between buyers of labor (employers) and sellers of labor (hired). This market includes not only specially organized institutions – labor exchanges, but also all individual labor recruitment transactions.

The labor market, like all other markets, operates on the basis of price equilibrium, i.e. the main market regulator is the price – in this case, labor (wages). It is with the help of wages, in their opinion, that the supply and demand of labor is regulated, their balance is maintained. Thus, the supply of labor is determined, first of all, by demographic factors – the birth rate, the growth rate of the able-bodied population, its gender and age structure. Salary is the market price of labor, which fluctuates around its basis – the natural price, a fair salary corresponds to the marginal productivity of labor, salary is the natural price of labor (the minimum means of subsistence of workers).

The peculiarity of the labor markets and labor supply is that in many ways the employee himself determines how much time he would like to work, and how much to set aside for an alternative type of occupation and recreation, This determines the duration of employment contracts in any sector of the economy, provided that the level of pay is satisfactory for the employee. Upon reaching a high financial situation and well-being, the employee will suspend further supply of his labor and refuse additional employment, even with continued wage growth In the labor market as a whole, labor supply is formed under the influence of a combination of the following conditions: the total population; the number of active able-bodied population; the amount of time worked per year; qualitative parameters of labor, its qualifications, productivity, specialization.

In the labor market, the supply of labor and the demand for labor of a certain type are formed. The labor market can function in any conditions. The simplest are the conditions of perfect competition.

A ***labor exchange*** is an organization specializing in performing intermediary operations between entrepreneurs and workers for the purpose of buying and selling labor. It makes it possible to streamline the hiring of labor by enterprises and reduce the time for citizens to find a job.

13. Capital market. Investment demand and its factors. ***Capital*** is a stock of productive resources involved in the production of a variety of goods; a value that brings a stream of income or a durable resource created for the purpose of producing more goods and services. Obtaining a certain flow of goods and services in the future presupposes the presence in the production process of a certain reserve of durable resources, i.e. capital.

Investment demand will depend on the so-called leasing cost of the equipment. The equipment can be offered through leasing companies. In most cases, new investments do not mean the purchase of equipment by the company, but its lease from specialized leasing firms for a fee, the amount of which varies depending, firstly, on the quantity offered, and secondly, on the demand for it.

Leasing is a form of long-term lease agreement. The lease agreement is characterized by certain conditions for the use of the leased property. In essence, it is a cross between a lease agreement and a loan agreement; in general, it has both signs.

To create and increase capital, investments of funds are necessary – investments.

Investments (capital investments) – a set of expenditures of material, labor and monetary resources aimed at the expanded reproduction of fixed assets of all sectors of the national economy.

14. Land market. Land rent. The price of land. In the broadest sense of the word, land includes all the benefits given to man by nature in a ready-made form (arable land, forests, mineral deposits, water sources). These are also climatic features, the power of wind, water, and solar energy. It follows from this that the term "earth" characterizes all the forces of nature used in production activities in order to meet human needs. Land as a factor of production has its own characteristics that serve as the basis for the development of agrarian relations:

– land is an irreproducible means of production. Man is not given to create it artificially, anew;

– the amount of land on our planet in general, and agricultural land in particular, is limited;

– land, unlike other means of production, with proper and rational use of it, does not waste its useful properties, but increases them;

– land plots differ in fertility, i.e. they have different natural productive power, as well as in location to sales markets. It is the unique conditions of the supply of land and other natural resources that generate land rent. Land rent is the price paid for the use of land and other natural resources, the amount of which (their reserves) strictly limited. Rent is one of the types of income on property, payment to the owner for permission to invest in land. Its size is determined by the lease agreement.

Land rent is the form in which land ownership is economically realized, brings profit. And although, as a type of income for property, land rent has been used for a long time, it has become possible to assign it to economic methods only in a market economy. In market conditions, it acts as an additional income, which splits into two parts: profit appropriated by the entrepreneur – tenant of the land, and rent, which goes to the landowner. In a market economy, land is sold and bought. And although it has no value itself, but due to the fact that it brings profit to a significant part of the population, land acquires a price. The price of land depends on two parameters:

– the amount of land rent that can be obtained from a land allotment;

– loan interest rates.

In essence, the price of land is the price of the land rent that it brings in accordance with the interest rate.

The price of land is capitalized rent, i.e. rent converted into monetary capital that generates income. The price of land is determined by capitalization of rent. The capitalized value of rent is the total value of all future lease payments that a given piece of land can bring. Thus, the price of land is equal to the amount of money, putting it in the bank, the former owner of the land would receive a similar percentage on the invested capital. The land price is calculated as follows: $RN = R / i$, where RN is the land price; R is the annual rent; i is the loan interest rate.

15. National economy: characteristics, structure, goals. *Goals of the national economy:*

– to ensure sustained high growth rates in the volume of production of goods and services without sudden changes, recessions and crises;

– to ensure the economic and social efficiency of production in conditions of limited resources;

– to ensure the stability of prices in a market economy, not by "freezing" them for a long period, but by regulating them in a planned manner;

– create a high level of employment – achieved when everyone who wants to get a job has it;

– fair distribution of income;

– environmental protection.

The structure of the national economy is the quantitative ratio between the elements of the national economy. Depending on the classification criterion, the following structures of the national economy can be distinguished:

– *reproduction* – division into economic spheres (groups of homogeneous industries). There are 3 major interrelated spheres: material production (industry, agriculture, construction, transport, communications, partly services), intangible production (science, art, education, etc.), non-productive sphere (defense, religion, public organizations);

– *social* – the division of the economy into sectors depending on ownership (public, private, mixed) and based on a joint form of ownership;

– *sectoral* – the allocation of large national economic sectors and sub-sectors (for example, industry and its sub-sectors: light, food, mechanical engineering, etc.);

– *territorial* – division into economic districts.

An important feature of the national economy is its macroeconomic proportions.

Macroeconomic proportions are quantitative relations between various divisions and spheres of social production, branches, territorial – production parts of the national economy.

Types of macroeconomic proportions:

– *general* economic relations between large spheres of the national economy: production and consumption, consumption and accumulation, tangible and intangible production between; I and II divisions of material production (volumes of means of production and consumer goods in the gross national product, the number of employees in each of these divisions);

– *intersectoral* – between industries, etc.;

– *intra-industry* – between interconnected industries within the same industry;

– *territorial* – general economic, inter- and intra-industry within the boundaries of a certain territory;

– *interstate* – between states on the basis of international division of labor;

– *cost* – between the individual elements of the value of the gross domestic product (monetary revenue, income in the areas of tangible and intangible production, income of enterprises, the state and the population);

– *resource* – between labor resources and production and non-production spheres, city and village, industries and regions;

Classical dichotomy and neutrality of money

In an economy with flexible prices, the general equilibrium is established at the intersection of the *IS* and Q^* graphs reflecting the state of affairs in the real sector of the economy – in the goods and labor markets. The *LM* curve and, consequently, the monetary sphere play no role in establishing general equilibrium. In case of disturbances caused by monetary shocks, the general equilibrium is restored by adjusting prices, shifting the *LM* curve until it passes through the equilibrium point of the real sector – the intersection point of the *IS* and Q^* graphs.

Thus, the monetary sector with flexible prices does not affect the real sector of the economy. Both sectors exist independently of each other. Production is determined solely by the scope of supply.

The theoretical position that in an economy with flexible prices, the real and monetary sectors exist independently of each other has been called the principle of ***classical dichotomy***.

In a dichotomized economy, *money is neutral*. An increase in the nominal money supply *M* causes a proportional increase in the price level *P* – such that the real supply of money *M*/*P* remains constant. As a result, the *LM* curve (whose position depends on *M*/*R*) remains in place. Real indicators of the product, interest rate, wages, money supply, etc. they do not undergo changes, only their monetary (nominal) expression changes – always in proportion to the price increase.

In an economy with sedentary prices, the principle of the classical dichotomy does not work.

In an economy with sedentary prices, the change in the nominal supply of money has an impact on the real sphere of the economy and, therefore, money is not neutral. Real variables – GDP, investment, consumption, interest rate, money supply (measured in constant prices), unemployment rate, etc. – deviate from their equilibrium values, at which the choice of economic entities is optimal.

QUESTIONS

1. What is the commodity market?
2. What are the non-price determinants of demand?
3. What is profit in economics?
4. What are the goals of the national economy?
5. What are the types of macroeconomic proportions?

9. THEORY AND POLICY OF ECONOMIC GROWTH

Basic concepts
Economic growth. Economic cycle. Production capability curve. Extensive growth. Intensive growth. Harrod – Domar model. Cobb – Douglas model. Solow model.

9.1. THE CONCEPT, INDICATORS AND FACTORS OF ECONOMIC GROWTH. EXTENSIVE AND INTENSIVE ECONOMIC GROWTH

Economic history shows that the market economy is developing unstable, cyclically. Its characteristic feature is fluctuations in income levels, employment and prices: industrial boom and price growth are replaced by falling output and unemployment.

Cyclicity is a universal form of movement of national economies and the world economy as a whole. It expresses the uneven functioning of various components of the national economy, the change of revolutionary and evolutionary stages of its development. The most characteristic feature of cyclicity is that the movement does not occur in a circle, but in a spiral. Therefore, cyclicity is a form of progressive development, a movement from one macroeconomic equilibrium to another. In fact, cyclicity is one of the ways of self-regulation of the market economy, including structural adjustment.

The economic (business) cycle is a period during which fluctuations in the level of business activity occur, expressed in changes in output and employment on the scale of the national economy. Each cycle has its phases, its duration. The characteristics of the phases are unique in their specific indicators. They are original both in historical and regional aspects. But despite the fact that economic cycles differ significantly from each other, the same phases can be distinguished in each of them (fig. 9.1).

At the ***peak*** of the cycle, all production capacities are involved, full employment is achieved. The price level tends to increase, and the growth of business activity stops.

With a ***recession***, output and employment decrease, prices, as a rule, remain at the same level.

During the ***depression*** (the lowest point of the recession), production and employment are at the lowest level.

With the ***revival***, the volume of national production and employment increase, and the overall price level increases.

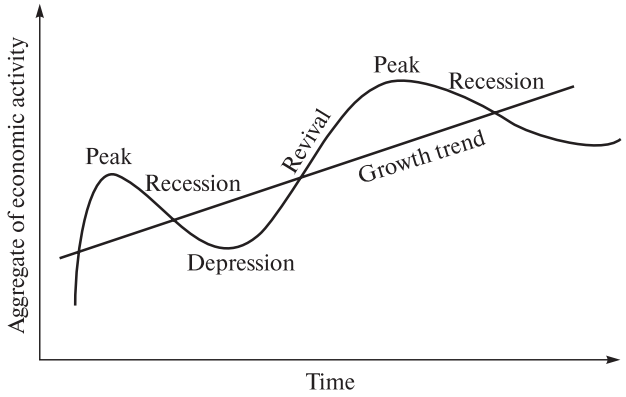

Fig. 9.1. Economic cycle

Output and employment are more responsive to the change of phases of the economic cycle in those industries that produce means of production and consumer durable goods. This is due to the fact that, firstly, during periods of downturns, the demand for these goods is significantly reduced; secondly, production in these industries is, as a rule, highly concentrated. A small number of firms dominate the market, which allows them to curtail production in a short time in order to stabilize prices. Therefore, in these industries, during periods of downturns, employment decreases rapidly, output falls, and unemployment increases.

In industries producing short-term goods (the markets for these goods are highly competitive), prices fluctuate to a greater extent than employment and output.

There are various theories explaining fluctuations in business activity.

Some economists focus on innovations. They argue that major technological innovations, such as railways, automobiles, or synthetic fibers, have a significant impact on investment and consumer spending, and consequently on production, employment, and price levels. But such major innovations appear irregularly and thus hinder the stability of economic activity.

Other scientists explain economic cycles by political and random events. Thus, the constant demand for military products during hostilities can lead to over-employment and acute inflation, which after the onset of peace and reduction of military spending is usually followed by an economic downturn. Politicians can manipulate monetary and fiscal policies to get re-elected to their positions.

Monetarists view the cycle as a purely monetary phenomenon that depends on the amount of money in circulation. When the government releases too

many of them, an inflationary boom occurs, and vice versa, a relatively small number of them accelerates the decline in national production and the growth of unemployment.

Keynesians believe that the factor directly determining the levels of output and employment is the level of total, or aggregate, spending. If the total costs are small, it is unprofitable for many enterprises to produce goods and services in large volumes. Hence the low level of output, employment and income. A higher level of total expenditure means that production growth is profitable, so output, employment and income will increase. When full employment occurs in the economy, the real volume of national production remains unchanged, and additional costs simply raise the price level.

Marxist economists see the reason for cyclicity in the periodic renewal of fixed capital.

However, not all fluctuations in business activity are explained by economic cycles. There are ***seasonal fluctuations*** in it. For example, a sharp increase in the volume of purchases before the New Year and other holidays leads to significant annual fluctuations in the pace of economic activity, especially in retail trade. Agriculture, construction and other industries are subject to seasonal fluctuations to varying degrees.

A special place in the theory of cyclicity is occupied by the long waves of N. D. Kondratiev, who opened a wide discussion on this problem in the 20s of the XX century. Analyzing the development of European countries over 100–150 years, the scientist identified the following large cycles: rises — 1789–1814, 1873–1896, 1896–1920; recessions — 1814–1849, 1849–1873. In the second half of the XX century, the study of long waves was also carried out by I. Schumpeter, S. Kuznets, K. Clark, W. Mitchell, P. Boccara, D. Gordon, T. Kuchinsky, etc.

The theory of long waves proceeds from the fact that the economic system is constantly in a state of deviation from macroeconomic equilibrium. Firstly, these are deviations of aggregate demand volumes from aggregate supply over long periods of time. Secondly, deviations caused by changes in demand for equipment, structures, construction materials, overcome within the framework of economic cycles of average duration. Thirdly, long-term (40–60 years) deviations from the equilibrium state characteristic of the markets of industrial buildings, infrastructure and labor.

Economic growth refers to an increase in the real volume of national output in the economy. To measure economic growth, indicators of absolute growth or the growth rate of real income (output) are used. Economic growth exists when the border of the country's production capabilities shifts in the external direction (fig. 9.2).

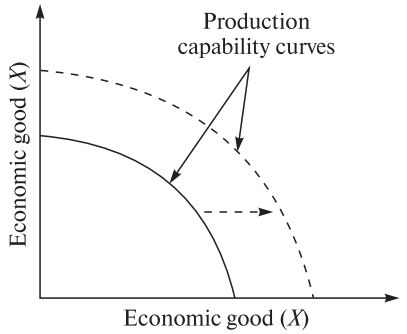

Fig. 9.2. Shift of the production capability curve

To estimate the output volume, indicators such as gross domestic product, gross national income, and net national income are used. The absolute value of these indicators, calculated for any state for a year, allows us to get a fairly accurate idea of its military-political potential: countries with higher GDP play, as a rule, a leading role in the global political arena and have advantages in military-strategic terms.

To characterize the dynamics of output volumes, an indicator of its growth rate is used, which is the percentage ratio of the magnitude of the change in real GDP (GNI, CNI) that occurred over a period (usually one year) to its initial value.

The higher (all other things being equal) the rate of economic growth, the more goods and services are available to people. This leads to an increase in living standards, provides an opportunity to solve a wider range of socio-economic problems, creates favorable conditions for further economic growth. However, it is obvious that economic growth is valuable not in itself, but as a basis for improving the welfare of the population, so its qualitative assessment is often given through an assessment of consumption dynamics.

At the same time, these indicators do not always indicate the efficiency of the economy and do not allow to fully assess the achieved standard of living. For these purposes, the most commonly used value of national income per capita and the growth of GDP or GDP per capita. These indicators are closely related to economic growth and determine the increase in the standard of living in the country in absolute terms or the rate of this increase.

The ability of an economy to grow depends on many factors, which primarily include: the quantity and quality of natural resources; the quantity and quality of labor resources; the volume of fixed capital; production technology. Only the strengthening of the action of at least some of them

ensures the growth process. However, even in this case, there may be situations when available resources, for one reason or another, are not employed in those areas in which they are able to function most effectively. But even if we assume that the available resources are involved precisely in "their" spheres, then this does not guarantee the full use of the available production potential – the size of aggregate demand may not be sufficient to involve all available resources in production.

Thus, in addition to the supply factors listed earlier, the ability of the economy to grow is influenced by distribution and demand factors. Depending on which of them provide economic growth, there are two types of it – extensive and intensive.

Economic growth is called ***extensive*** if it is carried out due to a quantitative increase in the factors of production with their qualitative immutability. The productivity of the attracted additional resources remains the same.

Intensive growth occurs due to the qualitative improvement of factors of production and technology, i.e. it is carried out not because of an increase in the volume of resource expenditures, but as a result of an increase in their returns, which leads to an increase in the welfare of the population.

In its pure form, neither one nor the other type, as a rule, do not occur, since in reality economic growth is also provided by an increase in the amount of resources used and an improvement in the use of production potential. Therefore, it is usually said about a predominantly intensive or predominantly extensive type of economic growth, depending on the combination of factors that caused it.

In accordance with the types of economic growth, its factors are also grouped. Extensive factors include the growth of capital, labor and land resources, intensive ones include technological progress, economies of scale of production, the growth of the educational and professional level of employees, increased mobility and improved resource allocation, improvement of production management, legislation, i.e. everything that allows you to qualitatively improve both the factors of production and the process their use. Sometimes aggregate demand is singled out as an independent factor of economic growth as the main catalyst for the expansion of production.

Resource and environmental constraints, a wide range of social costs of production, as well as inefficient economic policy of the state are often cited as reasons hindering economic growth.

For a long time, the need for economic growth was taken for granted. However, in recent years, a number of arguments have been put forward, according to which further economic growth in industrialized countries cannot be considered an unconditionally accepted goal. Representatives of

this direction, first of all, note the increasing negative impact of economic growth on the state of the environment, therefore, they consider it advisable to consciously restrain it in a number of cases.

According to the opponents of economic growth, many of the social problems of our time (for example, poverty) cannot be solved by further increasing the productive potential. The latter is already large enough to ensure universal well-being, the main task is reduced only to finding such a way of distributing the produced product that would lead to satisfying the social needs of society.

In addition, it is emphasized that material well-being cannot be the main (especially the only) goal of economic development. It is worth thinking about what the true needs of a person are and whether economic growth does not lead to the loss of many human values.

Despite many rational arguments, the position of opponents of economic growth as an "end in itself" cannot be considered quite convincing, since in some countries there are more acute problems than those indicated by adherents of this point of view.

An increase in production capacity and an increase in potential GDP are associated with a change in *either the quantity of resources* or the *quality of resources*.

There are two main types of economic growth: extensive and intensive.

Extensive growth in the *volume of production* occurs due to an increase in the number of factors of production used – land, labor, capital, entrepreneurship. At the same time, their qualitative and technical levels remain unchanged.

Intensive economic growth is characterized by an increase in the volume of goods produced by improving the quality of resources, using the achievements of scientific and technological progress.

Modern production is characterized by a combination of extensive and intensive factors. For example, there may be an attraction of labor to an improved technological base or an increase in the skill level of employed workers. Depending on which method of increasing the production of goods and services prevails, they speak of a predominantly extensive or intensive type of growth.

Accordingly, two types of economic growth are distinguished by two groups of factors.

Factors of an extensive type of economic growth: the use of more labor; the construction of new enterprises; the use of more equipment; the involvement of additional lands in economic turnover; the discovery of new deposits and an increase in mining; foreign trade, which allows to increase the amount of resources, etc. However, the qualification of workers and their productivity,

the quality of equipment and the technology does not change. Therefore, the return on output and income per unit of labor and capital remains the same.

Factors of intensive type of economic growth: the increase in the level of qualification and professional training of the workforce; the use of more advanced equipment; the most advanced technologies (primarily resource-saving); scientific organization of labor; the most effective methods of state regulation of the economy.

Scientific and technological progress plays the most important role among the intensive growth factors. NTP is based on the accumulation and expansion of knowledge available to society; on scientific discoveries and inventions that provide new knowledge; on innovations that serve as a form of realization of scientific discoveries and inventions. It is scientific and technological progress that ensures the improvement of the quality of resources.

The main reason that today's standard of living is higher than it was 100 years ago is new technological knowledge. Technological knowledge is an understanding of the best ways (methods) of producing goods and services. New technologies make labor more efficient and make it possible to increase the production of goods and services. Telephone, computer, internal combustion engine, conveyor, are among the thousands of technical innovations that have increased the production of goods and services.

9.2. THEORIES OF ECONOMIC GROWTH

Currently, there are three directions of economic growth:

1) neo-Keynesian;
2) neoclassical;
3) historical and sociological.

In the neo-Keynesian direction, economic growth is seen as an unstable phenomenon. Therefore, the formation of demand for investments should play an important role in ensuring growth. The models of the Neo-Keynesian direction include the ***models of R. Harrod and E. Domar***.

R. Harrod formulated a number of dynamic equations, each of which reflects the features of economic growth. At the same time, they are allocated: a) a "guaranteed" growth rate, i.e. one that creates conditions for equality of savings and investments, determining the trajectory of sustainable economic growth; b) a "natural" growth rate corresponding to the growth rate of population and labor productivity, i.e. it coincides with the potential production opportunities.

The guaranteed growth rate, as a rule, does not coincide with the "natural" one. Deviations generate long-term trends in the economy in the form of

stagnation or inflation. Therefore, in order to maintain sustainable growth, government intervention in the regulation of aggregate demand is necessary.

E. Domar's model takes into account the dual role of investments, which not only create income that affects the volume of aggregate demand, but also lead to an increase in production capacity, and consequently, to an increase in market supply. E. Domar sees the main task of economic growth in determining the amount of investment necessary for such an increase in income, and hence effective demand, which would cover the increase in the supply of goods caused by the growth of production capacity. In his opinion, it is possible to find such rates of economic growth that would ensure equality of income growth and output growth, and, consequently, equality of aggregate demand and aggregate supply in the process of economic growth.

The models of R. Harrod and E. Domar are often considered as a combined Harrod – Domar model.

The Harrod –Domar equation for determining growth rates is as follows

$$T_P = S/C,$$

where T_P is the rate of economic growth; S is the ratio of net savings (investments) to total income (S/ND); C is the capital intensity coefficient, defined as the ratio of fixed capital to output (K/ND).

A large value of S (accumulation rate) leads to a high growth rate. The lower the coefficient of capital intensity of products C, the more products will be received. Consequently, the growth rate is directly proportional to the S – rate of accumulation and inversely proportional to the C – coefficient of capital intensity of production.

The neoclassical direction in the study of economic growth uses for quantitative analysis a production function that considers the dependence of the volume of production on only two factors – capital and labor.

The two-factor model was proposed by American scientists C. Cobb and P. Douglas and was called the Cobb – Douglas model.

In the future, the Cobb-Douglas production function became widely used in the development of economic growth models with an expanding number of factors of production. Thus, the American economist R. Solow in the article "Technological progress and the aggregate production function" attempted to investigate the functional dependence of the volume of production on technological progress. R. Solow used several equations to describe the macroeconomic system. His developments provided broader opportunities for analyzing trends in the development of macroeconomic systems, and served as an impetus for the development of numerous models of this type. In general, neoclassical models of economic growth, based on the production function,

define a system of quantitative characteristics for assessing the impact of factors of production on economic growth.

In the conditions of the neoclassical model of economic growth, the golden rule of accumulation applies. It consists in the following: the per capita consumption fund grows at the maximum rate if the savings rate is equal to the elasticity of capital output.

The representative of the historical and sociological direction is the American economist W. Rostow, the author of the theory of stages of economic growth. He identifies the following stages:

– class society: static equilibrium, limited opportunities to use the results of scientific and technological progress, falling per capita income;

– the stage of creating conditions for a run-up: conditions for a run-up are gradually formed due to some increase in the efficiency of production processes;

– the run-up stage: by increasing the share of investments in national income, using the achievements of scientific and technological progress, resistance to development is overcome;

– the path to maturity: the pace of economic growth is increasing, the increase in production is outpacing the growth of the population;

– a society of high mass consumption: concerns about the limitations associated with the volume of production are disappearing, the importance of durable goods is growing.

Economic growth models allow assessing the consequences of many economic processes, creating "rules of economic behavior" that combine both social and economic aspects.

And yet these models differ from each other. So Keynesian models, as well as teaching in general, are based on demand, which ensures balanced economic growth. The main part of the demand is capital investments, which increase profits through the multiplier effect. Keynesians do not share the neoclassical position of the efficiency of factors of production and their interchangeability.

9.3. ECONOMIC POLICY AND ECONOMIC GROWTH

The state, with the help of economic policy, can influence the amount of physical and human capital. If the capital stock in the economy grows, then the economic potential of the country increases, and the economy can produce more goods and services in the future. Therefore, in order to accelerate economic growth, the government should pursue the following policy.

1. *Stimulate domestic investment* and *savings*. The higher the share of investments in the economy (for example, in Japan, South Korea), the higher the rate of economic growth. The basis of investments is savings. If a society consumes less and saves more, it has more resources to invest.

2. *Encourage investment from abroad*. There are two types of foreign investments: direct and portfolio. Foreign direct investment is an investment in capital owned and managed by foreigners. Portfolio foreign investments are investments in securities that do not give a foreigner the right to control the object of investment. Foreign investments ensure the growth of the country's economy. Despite the fact that part of the income of firms created with the participation of foreign capital goes abroad, foreign sources of financing increase the economic potential of the country, increase the level of productivity and wages. In addition, foreign investment allows developing countries to master the most advanced technologies developed and used in developed countries.

3. *Stimulate education*. Education is an investment in human capital. In the United States, according to statistics, every year spent on study increases an employee's salary by an average of 10 %. An educated person can put forward ideas that become useful to others, everyone who falls within the scope of the positive external effect of education has the opportunity to use them. This is an argument in favor of public education. In this regard, the "brain drain" has particularly negative consequences, that is, the emigration of educated and qualified specialists from poor countries and countries with economies in transition to rich countries with a high standard of living.

4. *Stimulate research and development*. Research and development can be stimulated by grants, tax cuts and patents to establish temporary ownership of inventions.

5. *Protect property rights* and *ensure political stability*.

6. *Stimulate free trade*. Free trade allows a country not to produce all the products itself, but to buy from other countries those types of products that they produce more efficiently. The expansion of trade with developed countries not only allows developing countries to save on costs and not to produce products whose production is inefficient, but also to use the latest world technical and technological achievements.

7. *Control population growth*. To ensure the growth of welfare, the growth rate of production should be higher than the growth rate of the population. Meanwhile, high population growth rates reduce opportunities for economic growth. Thus, rapid population growth reduces the capital ratio, i.e. the amount of capital per worker, which leads to a decrease in labor productivity and well-being.

In recent years, the pace of economic growth on a global scale has slowed down. The reasons for this were:

– state regulation in the field of environmental protection, the imposition of prohibitions and restrictions on the use of efficient production for environmental reasons;

– increased spending on safety and health;

– the oil shock of the 70s, caused by the policies of OPEC member countries, made part of the capital prematurely obsolete;

– reorientation of the national economy to the service sector, which today accounts for 50–60 % of GNP in market economies.

First, economic growth is the basis for improving living standards.

Secondly, it creates conditions for the implementation of social programs, the elimination of poverty, the development of science and education, and the solution of environmental problems.

Thirdly, economic growth increases the productive capacity of the economy, allows solving the problem of limited resources. Thanks to him, new types of resources are created, new technologies that allow increasing and diversifying the production of goods;

Fourth, economic growth is the only real way to achieve a fair distribution of income in the economic system.

However, by itself it is not able to solve many economic, social, environmental, etc. problems. Moreover, economic growth has ***significant costs***.

1. *Opportunity costs*, i.e. the need to sacrifice current consumption (consumption in the present) in order to ensure economic growth and be able to increase consumption (welfare) in the future. On the one hand, an increase in investment in the production of investment goods leads to a reduction in resources allocated to the production of goods and services used for current consumption. On the other hand, the basis of investments is savings, which are part of disposable income. With a given amount of disposable income, the growth of savings to ensure an increase in investment and, consequently, an increase in consumption in the future, requires a reduction in consumption in the present.

2. *Costs associated with a decreasing return on investment* (capital). As the capital stock grows, the additional output produced by an additional unit of capital decreases.

3. The *costs associated with environmental pollution*. Almost everything that is involved in production is returned to the environment as waste after a certain period of time. (At the same time, the paradox lies in the fact that the solution to environmental problems can be found only on the ways of further development of technological progress).

9.4. FEATURES OF ECONOMIC GROWTH OF VARIOUS GROUPS OF COUNTRIES

Each country, each economic system has its own model of the organization of the economy and economy. This is primarily due to the fact that countries differ in various ways:

– geographical location (island mentality does not allow residents of island states to build the same economic models as citizens of continental countries);

– historical and cultural development – the stages of historical development have left special imprints not only on the development models, but also on the ways of thinking, as well as on the production capacities and economic potential of different states;

– national peculiarities.

The modern market structure considers various models – Western European, American, Japanese. However, there are others.

The American model of economic development is based on large-scale encouragement of the activity of small and medium-sized businesses, which allows enriching most of the adult capable population. There are low-income people, but at the same time they have access to an adequate standard of living thanks to various benefits, benefits, tax breaks.

In the American model of 2023, there is no social equality as such, the benchmark is on social security. This model is based on highly efficient production, as well as the motivation of the masses for personal development and entrepreneurship. In general, this economic system is regulated by the state, which allows you to maintain a confident market situation in equilibrium.

The Western European model of economic development of the current 2023 model, in fact, grew out of the post-war period, when the Democrats got power. The main characteristics of the Western European model are the significant influence of the state sphere on economic and social development, including in social infrastructures and in industry.

Administrative regulation of various branches of the economy in Western Europe also implies the implementation of national development programs. What does this mean in practice? The economic sector is managed centrally, the responsibility lies with the state authorities. The state authorities think over the development of certain sectors of the economy for the near and long-term period, and transfer them to implementation.

The Western European model pays special attention to the financing of social needs, if the American model is focused on ensuring that every citizen strives for financial independence and independently solves their difficulties,

the Western European model implies the initial protection of their citizens from social needs. The modern Western European model is conditionally divided into Swedish, West German and others.

The countries of the world can be divided into three groups:

Countries with a high level of development and market economy – these include almost all states of Western Europe and the United States of America, as well as Israel, Australia, Canada, New Zealand and Japan. These states have a high level of development both in the social environment and in the economic one.

The transitional economy is characteristic of the Russian Federation and the countries of Eastern Europe, as well as some Asian states – for example, China, Vietnam, Mongolia and former countries belonging to the USSR.

Developing countries differ from developed countries in that their total GDP does not reach a quarter of GDP, which is customary for developed countries. These are Asia, Africa, Latin America, the countries of the former Yugoslavia, as well as the States of Oceania.

Developed countries occupy the post-industrial stage of production, which means that the dominant environment in them is the service sector. If we estimate GDP per person, then according to the PPP, the GDP is at least 12,000 US dollars.

The share of developed countries in the world gross domestic product:

Germany – 3.45 %;

Russia – 3.29 %;

Federal Republic of Brazil – 3.01 %;

Indonesia – 2.47 %;

French Republic – 2.38 %;

United Kingdom – 2.36 %;

United Mexican States – 1.98 %;

Italian Republic – 1.96 %;

South Korea – 1.64 %;

Saudi Arabia – 1.48 %;

Canada – 1.47 %;

Other states – 30.75 %.

The most influential highly developed countries are among the Big Seven – Canada, Japan, USA, France, Germany, England and Italy.

Countries that are developing according to the model of a transitional economy are gradually moving from administrative and team work to market relations. This process began more than 30 years ago, during the destruction of the socialist system.

Developing countries (also often referred to as third world countries) have a low social and economic level of development. These countries are the largest,

their population is 4/5 of the total population of the globe, and they account for less than 1/3 of the global gross product. However, developing countries can be distinguished by other signs.

The United States has the most developed economy in the world. This is followed by China, Japan, Germany and the United Kingdom. Each individual country has its own economic policy, which inherently has both strengths and weaknesses. If the state is rich in minerals, then most often the economy is based on the export of resources, which weakens the production component.

United States of America

The most stable economy in the world belongs to the United States, it has held its leading po sition for more than 100 years. A comprehensively developed economic policy is based on the banking system, the largest stock exchange, advanced technologies in the field of IT and agriculture, which is not devoid of innovative solutions and progress.

America, thanks to its significant coverage of fields of activity and advanced technologies in them, has a great influence in the world and enjoys it.

The dollar has been a world currency for many years and is quoted in all countries. The GDP figures for 2019 amounted to $ 20.494 trillion, which makes it clear why the US economy is the first, leading the rating.

China

The fastest-growing economy, capable of soon pushing America and moving it from its leading position in the TOP of the largest economies in the world. Industry, agriculture and technology are actively growing in China. The automotive market is larger than the American and Japanese combined.

Chinese clothing and equipment enters the markets of most countries, exports in all directions are very developed. China provides food for 1/5 of the world's population, while using only 9 % of the land intended for agriculture.

Annual GDP growth is 10 %, which gives cause for concern to America. The economies of Asian countries are represented in the TOP economies of the world in the person of China, as the strongest and most developed power, the rest of Asia has weaker indicators.

Japan

A small country with high discipline and hard work of its citizens, which made it possible to achieve great success in the field of technology and production. A high standard of living is recorded here and lifelong employment

of citizens is practiced, it is believed that the longer a person has worked in one place, the more prestigious it is.

The country's banking sector is stable and developed, high technologies allow it to compete on an equal footing with America and China, and in the field of robotics, Japan has come far ahead, overtaking the United States. Japan's GDP for 2022 amounted to $4.970 trillion, which allowed it to take the honorable 3rd place among the leading countries of the world.

Germany

Germany's economy is the strongest in Europe, it is based on the service sector, industry and mechanical engineering, which, in turn, accounts for only a fifth of the country's GDP growth.

Having recovered after two world wars, the country has not only built a stable and correct economic policy, but is also one of the leaders, entering the ranking of states with the highest standard of living.

Despite the crisis that Europe has been experiencing in recent years, Germany is still stable on its feet and provides itself with annual GDP growth, which at the moment amounted to $ 3.996 trillion.

Great Britain

The economy of Western Europe in the face of the participating countries presents a blurry picture, but the undisputed leader is the United Kingdom, which entered the overall rating for all countries of the planet. The country is poor in natural resources, so its economic policy is based on services, industry and tourism.

With regard to industry, the leaders are the following areas: aviation and pharmaceuticals, as well as the automotive and textile industries. The UK attracts investment injections from business representatives of other countries with its liberal banking policy, which allows for the implementation of money laundering.

But in 2018, the country is leaving the European Union, and experts find it difficult to guess what damage this will bring to the state's economy and how its position in the world will change.

France

The economic situation of the country has been achieved thanks to the industrial and agrarian policy. Due to agriculture, France provides EU countries with products, a quarter of all supplies fall to the share of this state.

The country's best attendance figures were achieved largely thanks to the Eiffel Tower, its recognizability and the atmosphere of romance associated with it.

But having a high attendance of the country, France does not come out on tourism. The fact is that the funds left by tourists in the state have a smaller volume compared to America, this is due to the fact that tourists in France do not stay long, but after seeing the main attraction, they leave for neighboring countries. France's GDP currently stands at 2.777 trillion US dollars.

States not included in the top 10

In general, the economy of the countries of the world in 2022 according to the rating has not changed much, but Russia has dropped out of the list.

Russia's GDP amounted to $1.657 billion, and this figure was higher than that of South Korea and Spain, so Russia now ranks 11th. This is due to the events of the last 5 years, when Crimea joined the state and hostilities began in eastern Ukraine, as a result of which sanctions were applied against Russia in Europe and a number of other states, worsening the economic situation of the country.

The economy of the Eastern European states is at a low level compared to many EU countries. This is due to the fact that most of the countries were part of the USSR, which had a significant impact on their economy, which led to the closure of the countries, and after the collapse of the union they had to build relationships with other countries almost from scratch.

The European economy for 2023 as a whole is experiencing stable GDP growth in general terms. Western Europe generally retains a leading position in comparison with Eastern Europe.

Among the worst economies in the world of third world countries, one can single out a country like Venezuela. The state has the largest oil reserves in the world, but at the same time, thanks to the extremely inefficient policy of the current leadership, the country is almost on the verge of bankruptcy, 95% of the population lives below the poverty line, and the national currency of Venezuela is worth less on the market than gold in the famous online game World of Warcraft.

The economies of the world are radically different, each state conducts its own policy, having its own idea of the final result and how to achieve it. The table of GDP indicators allows you to compare whose policy is more successful, and therefore more correct.

The United States still has the strongest economy, its influence on the world and the politics of countries is increasing and there is a steady increase in GDP, despite the presence of a large external debt. But at the same time, China is rapidly catching up with the United States of America, demonstrating the real wonders of economic movement and development in recent decades.

Moldova was recognized as the worst European country in terms of GDP growth, its economy is heavily dependent on the country's agricultural component and agricultural exports.

There are no powerful technologies and industry in the country, and after the collapse of the USSR, the energy resources of the state are purchased, minerals are not extracted and all the emphasis is only on growing crops and wine production.

From all of the above, we can understand that the economic development of the state depends not so much on the availability of certain resources in the country, as on really competent administrative management.

An example is Japan, a country completely destroyed and crushed during the Second World War, which, without any serious resources and even territory, is currently one of the world leaders in economic development.

QUESTIONS

1. What is the "economic (business) cycle"?
2. What are the reasons for the cyclical economy in terms of monetarists and Keynesians?
3. Name the industries in which there are seasonal fluctuations in business activity.
4. What is the essence of long waves N. D. Kondratieff?
5. Give the definition of economic growth.
6. How is economic growth related to the welfare of the people?
7. What indicators can be used to evaluate the economy chesky growth? Growth in the well-being of the population?
8. What is the importance of economic growth?
9. What are the main sources of economic growth?
10. What is the difference between an intensive type of economic growth from extensive?
11. Give arguments of supporters and opponents of economic growth.
12. What new things did E. Domar introduce into the theory of J. M. Keynes?
13. List the assumptions in the E. Domar model.
14. What should be the growth rate of investments to reach decrease in equilibrium economic growth?
15. What is the essence of the accelerator principle?
16. What is meant by a guaranteed growth rate and in the model of R. F. Harrod?
17. What are the similarities and differences between the models of E. Domar and R. F. Harkind?
18. Describe the Cobb production function — Douglas.
19. How the savings rate affects sustainable growth in the Solow model?
20. Why should you choose the level of capital stock, according to following the "golden rule"?
21. Is it worth maintaining a steady state with a margin capital exceeding the level stipulated in the "gold rule"?
22. How does the rate of population growth affect the sustainable rate growth?

10. PROBLEMS OF MACROECONOMIC POLICY

Basic concepts
Discretionary policy. Policy according to the rules. Active and passive economic policy. Internal lag. Decision lag. Balance sheet surplus. Excessive deficit. Policy delays. Policy objectives. Theoretical approaches to economic policy making.

10.1. FORMS AND TYPES OF ECONOMIC POLICY

The state creates and provides the institutional foundations for the functioning of the economy (legislative framework, security system, insurance system, tax system, etc.); provides and controls the supply of money in the country; conducts macroeconomic policy, which is divided into:

– o structural, ensuring economic growth;

– o conjunctural (stabilization), aimed at smoothing cyclical fluctuations of the economy and ensuring full employment of resources, stable price levels and external economic equilibrium).

The main types of stabilization policy are fiscal (or fiscal) policy, monetary (or monetary) policy, foreign economic policy, income policy.

Why do we need a stabilization policy? The natural development of the economy is accompanied by fluctuations. If households and firms are pessimistic about the economic outlook, they reduce spending, which leads to a decrease in aggregate demand for goods and services. A reduction in sales leads to the dismissal of workers, real GDP and other income indicators are declining. An increase in unemployment and a reduction in income lead to an increase in pessimism and can trigger an economic downturn. Monetary and fiscal policy make it possible to stabilize aggregate demand, and, consequently, the volume of production and the level of employment. The instruments of economic policy, when properly applied, benefit every member of society.

The danger of state intervention Some economists argue that the Great Depression of the 1930s was the result of destabilizing effects of the state. When treating a sick economy, you need to follow the rule: do not harm the patient.

The internal reserves of the economy are quite large and intervention is required in extreme cases.

Stabilization policy in a closed and open economy

Stabilization policy is a government policy (a set of measures of state influence on the economy) aimed at ensuring a double equilibrium – internal (defined, as a rule, as ensuring total output at the level of full employment of resources, i.e. at the level of potential GDP) and external (understood as ensuring balance of payments equilibrium).

As an example of measures of state influence on the economy, we will consider some features of fiscal policy in economically developed countries (ensuring internal equilibrium), as well as the Mandell – Fleming model for ensuring double equilibrium in a small open economy.

The impact of fiscal policy instruments on aggregate supply

Fiscal policy instruments such as taxes and transfers act on aggregate demand and aggregate supply. Tax cuts and increased transfers can be used to stabilize the economy and combat cyclical unemployment during the recession, stimulating the growth of aggregate spending, and, consequently, business activity and employment. However, simultaneously with the growth of aggregate output, the reduction of taxes and the growth of transfers causes an increase in the price level, i.e. provokes inflation. Therefore, during the boom period, when the economy is "overheated", an increase in taxes and a reduction in transfers can be used as an anti-inflationary measure and tools to reduce business activity and stabilize the economy.

Laffer curve

Since firms view taxes as costs, an increase in taxes leads to a reduction in aggregate supply, and a reduction in taxes leads to an increase in business activity and output. A detailed study of the impact of taxes on aggregate supply belongs to the economic adviser to the President of the United States R. Reagan, an American economist, one of the founders of the concept of the "economic theory of supply" Arthur Laffer. He constructed a hypothetical curve (fig. 10.1), with the help of which he showed the impact of changes in the tax rate on the total amount of tax revenues to the state budget. This curve is called hypothetical because Laffer made his conclusions not based on the analysis of statistical data, but on the basis of a hypothesis, i.e. logical reasoning and theoretical inference.

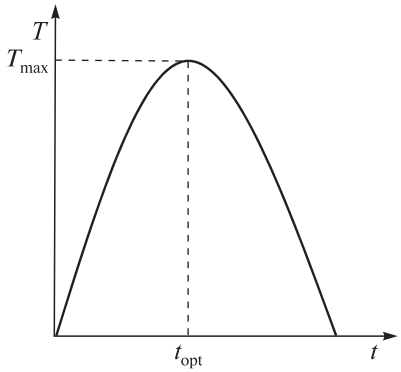

Fig. 10.1. The Laffer curve

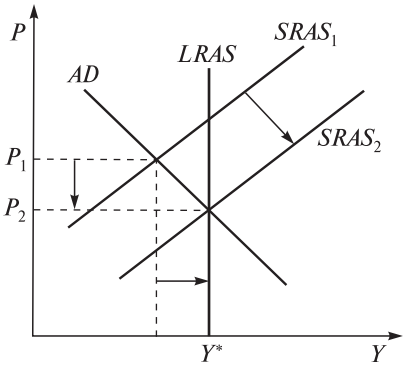

Fig. 10.2. Impact of tax cuts on aggregate supply

Using the tax function: $T = tY$, Laffer showed that there is an optimal tax rate (t_{opt}) at which tax revenues are maximized (T_{max}). If the tax rate is increased, then the level of business activity (total output) will decrease and tax revenue will decrease as the taxable base (Y) will decrease. Therefore, in order to combat stagflation (a simultaneous decline in production and inflation), Laffer in the early 80s proposed such a measure as a reduction in the tax rate (both income and corporate profits). The fact is that, unlike the effect of tax cuts on aggregate demand, which increases output but provokes inflation, the effect of this measure on aggregate supply is anti-inflationary in nature (fig. 10.2), i.e. production growth (from Y_1 to Y^*) is combined in this case with a decrease in the price level (from P_1 to P_2).

Advantages and disadvantages of fiscal policy

Let's consider the ***advantages*** of fiscal policy.

1. *Multiplier effect.* All fiscal policy instruments, as we have seen, have a multiplier effect on the equilibrium aggregate output.

2. *No external lag (delay).* The external lag is the period of time between the decision to change the policy and the appearance of the first results of the change. When the government decides to change the instruments of fiscal policy, and these measures come into effect, the result of their impact on the economy appears quite quickly.

3. *The presence of automatic stabilizers.* Since these stabilizers are built-in, the government does not need to take special measures to stabilize the

economy. Stabilization (smoothing of cyclic fluctuations in the economy) occurs automatically.

Let's consider ***disadvantages*** of fiscal policy.

1. *Crowding out effect:* an increase in budget expenditures during a recession (an increase in government purchases and/or transfers) and/or a reduction in budget revenues (taxes) leads to a multiplicative increase in total income, which increases the demand for money and raises the interest rate in the money market (price loan). And since loans are primarily taken by firms, the rise in the cost of loans leads to a reduction in private investment, i.e. to "crowding out" part of the investment costs of firms, which leads to a reduction in output. Thus, part of the total output is "crowded out" (underproduced) due to a reduction in the amount of private investment spending as a result of an increase in the interest rate due to the government's stimulating fiscal policy.

2. *The presence of an internal lag.* The internal lag is the period of time between the need to change the policy and the decision to change it. Decisions to change fiscal policy instruments are made by the government, but their implementation is impossible without discussion and approval of these decisions by the legislative body (Parliament, Congress, State Duma, etc.), i.e. giving them the force of law. These discussions and agreements may require a long period of time. In addition, they only come into effect starting from the next fiscal year, further increasing the lag. During this period of time, the situation in the economy may change. So, if initially there was a recession in the economy, and measures of stimulating fiscal policy were developed, then at the moment they begin to operate, the economy may already begin to rise. As a result, additional stimulus can lead the economy to overheat and provoke inflation, i.e. have a destabilizing effect on the economy. Conversely, contractionary fiscal policies designed during the boom may exacerbate the recession due to the presence of a long internal lag.

3. *Uncertainty*. This shortcoming is typical not only for fiscal, but also for monetary policy. Uncertainty concerns:

– problems of identifying the economic situation It is often difficult to pinpoint, for example, the moment when a recession ends and a recovery begins, or the moment when a recovery turns into overheating, etc. Meanwhile, since it is necessary to apply different types of policies (stimulating or restraining) at different phases of the cycle, an error in determining the economic situation and choosing the type of economic policy based on such an assessment can lead to destabilization of the economy;

– the problem of how much should change the instruments of public policy in each given economic situation. Even if the economic situation is correctly defined, it is difficult to determine exactly how much, for example,

it is necessary to increase government purchases or cut taxes in order to ensure the recovery in the economy and achieve potential output, but not exceed it, i.e. how to prevent overheating and acceleration of inflation. And, conversely, how not to bring the economy into a state of depression when conducting a restrictive fiscal policy.

4. *Budget deficit*. Opponents of Keynesian methods of economic regulation (monetarists, supporters of supply-side economics and the theory of rational expectations) consider the state budget deficit to be one of the most important shortcomings of fiscal policy. Indeed, the instruments of stimulating fiscal policy, carried out during a recession and aimed at increasing aggregate demand, are an increase in government purchases and transfers, i.e. budget expenditures, and tax cuts, i.e. budget revenues, leading to an increase in the government budget deficit. It is no coincidence that the recipes for state regulation of the economy that Keynes proposed were called "deficit financing". The problem of financing the state budget deficit has become one of the most important macroeconomic problems.

Stabilization policy in a small open economy: the Mundell – Fleming Model

There are two types of open economy: small open economy and large open economy. A ***small open economy*** refers to the economy of a country that is heavily influenced by the economies of other countries, but which has little or no effect on the economic development of other countries. The difference between the world interest rate and the domestic interest rate is the only factor that determines the direction of capital movement. A ***large open economy*** is an economy that has a significant impact on the development of the economies of other countries, determining the level of the world interest rate and providing a significant share of international trade and financial transactions.

To analyze the most effective ways to achieve the goal of ensuring dual equilibrium in a small open economy, the Mundell – Fleming model is used, proposed in the early 60s by Columbia University professor (USA) Robert Mundell and an employee of the International Monetary Fund (IMF) Marcus Fleming. The model was developed for a fixed exchange rate regime, but it is also applicable to a floating exchange rate regime. The Mundell – Fleming model is a Keynesian-type model, it was developed on the basis of the *IS–LM* model and explores the conditions for establishing a double equilibrium in the short term. Just like the *IS–LM* model, it allows one to find out the conditions for establishing internal equilibrium and evaluate the effectiveness of various types of policies in a closed economy. The Mundell – Fleming model

is also used to assess the consequences of monetary, fiscal and foreign trade policies in an open economy. To this end, it is necessary to complement the *IS–LM* model with a balance of payments equilibrium curve. The balance of payments is in equilibrium if the sum of the current account balance and the capital account balance is zero: $NX + CF = 0$.

The Mundell – Fleming model is based on 2 markets – commodity and money. The interaction between them is viewed through the prism of interest rates and the exchange rate of the currency (fig. 10.3). The model assumes that the price level is constant and therefore changes in the real exchange rate are proportional to changes in the nominal rate. That is, with an increase in the nominal exchange rate, domestic goods become more expensive, and imported goods become cheaper, which reduces exports, stimulates imports, that is, reduces net exports (*NX*).

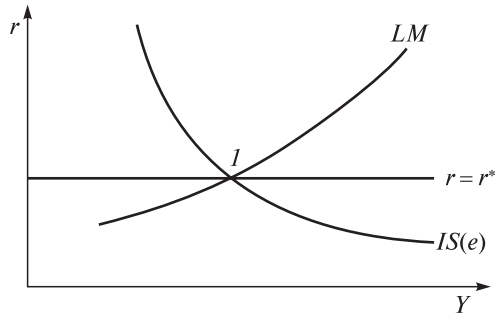

Fig. 10.3. Mundell – Fleming model

The location of the *IS* curve depends on the exchange rate *e*, which is calculated as the amount of foreign currency received per unit of national currency. When the exchange rate appreciates, domestic goods become more expensive, net exports decrease, and the *IS* curve shifts down to the left. Ultimately, the *IS* curve must pass through the intersection point of the *LM* and $r^* = r$ curves. If, for example, the *IS* curve passes above the equilibrium world rate, this will mean that the domestic interest rate has settled at a level above the world rate, and then foreign investment will go into the economy of this country. If the domestic rate is below the world rate (that is, the *IS* curve crosses the *LM* curve at a level below the world rate), investors will seek to withdraw capital from the country, the national currency will depreciate, net exports will increase, and the *IS* curve will shift upwards to the right until it intersects with the *LM* curves and $r^* = r$. Thus, all three curves: *IS*, *LM* and *r* intersect at one point, at the level of the world interest rate r^*.

The balance of payments curve is positively sloping as income growth leads to an increase in imports and to a current account deficit (negative net exports). To ensure equilibrium (zero balance) in the balance of payments, the current account deficit must be offset by an equal positive capital account balance. The inflow of capital into the country can be ensured only if the domestic interest rate rises. The excess of the domestic interest rate over the world interest rate means that the return on the financial assets of this country will be higher than in other countries, and will make them more attractive to foreigners. Thus, a higher level of income must correspond to a higher rate of interest. That is why economists so closely monitor the slightest fluctuations in the discount rate of interest in the largest economically developed countries.

10.2. THEORETICAL APPROACHES TO THE DEVELOPMENT OF ECONOMIC POLICY

The theoretical study of the role of the state in the economy as a complex socio-economic phenomenon requires an integrated approach, including the following levels: general philosophical, socio-philosophical, political economic proper. Some theoretical aspects of the indicated problem related to the implementation of this approach will be touched upon in the article.

In general philosophical terms, the disclosure of the need for the presence of the state in the economy, primarily in the form of macroregulation, its essence and development prospects must be approached from the standpoint of the relationship between the whole and the part.

Moreover, it is necessary to proceed from the fact that we are talking about an organic whole, about the dialectic of the whole and the part, when in the process of the development of an object as a whole, its self-differentiation occurs, the allocation of various parts in the political economy sense, this means that the economic role of the state, the role of the state in a market economy should be considered as an organic component of modern economic systems, the internal moment of the functioning of the economy.

The role of the state in a market economy appears as a natural result of the evolution of a market economy, a way to resolve contradictions, to overcome the "failures" of the market. In economic theory, they usually include: the existence of a tendency to establish monopoly control over the market; uneven distribution of information in the economic environment; failure to produce "public goods"; inability to comply with socially acceptable boundaries of inequality in the distribution of income; inability to eliminate negative "external" effects. Accordingly, if we leave aside the administrative and

legal functions, then the actual economic functions of the state are as follows: organization of money circulation; production of "public goods"; regulation of "natural monopolies"; elimination of excessive social inequality; protecting society from negative externalities; smoothing the economic cycle.

In turn, if the very role of the state in a market economy is considered as a whole, relatively independent entity (subsystem), then its study involves identifying in it such necessary aspects (relations) that are the simplest and determining in this whole. In this case, we are talking about the characteristics of the base.

Accordingly, all other necessary parties and connections that are formed under the direct influence of the framework are reasonable. The derivation of the justified from the basis presupposes consideration of the latter in motion, change and development, which requires the disclosure of opposite sides in the basis, tendencies that cause the change of the basis, its transition from one qualitative state to another.

This means that the role of the state in a market economy, and if we take the public sector more broadly, have their own internal impulses for development and expansion. In this regard, K. Eklund's remark is characteristic when analyzing the development of the public sector in Sweden. "The public sector, he notes, if it has already begun to grow and has reached a certain size, it can begin to develop "on its own", based on its own internal logic of the political decision-making mechanism.

Thus, the state is not outside the economic system, but in it. The former opposition of the state and the market in developed countries has lost its meaning: both the state and the market occupy a very specific place in the socio-economic system, perform functions inherent only to them and exist in an inseparable unity.

Actually political economic analysis of the content of the role of the state in the economy, strictly logical focus, consistency and completeness of the study is given by a theoretical model of economic (production) relations.

It seems reasonable to proceed in this case from the fact that the fundamental structure of any economic relationship under all conditions and at all stages of development of social production is characterized by a contradictory interaction of multidirectional interests of politically-economically differentiated subjects regarding a particular object.

Accordingly, the necessary moments of a detailed political and economic analysis of a socio-economic phenomenon (in our case, the role of the state in the economy) are the characteristics of the specifics of the subjects and objects of the relationship under consideration, as well as the economic interests inherent in the subjects and the contradictions arising from the interaction of the latter.

The political economy analysis of the role of the state in the economy presupposes, first of all, the characterization of the state as an economic entity, then as a subject of macroregulation.

As a scientific category of political economy, "subject" means each of the parties of economic relations that necessarily interact on the basis of acquiring the appropriate political, economic, and differentiating sign, as a result of which the activity of subjects acquires an objective content. This provision in relation to the state requires specification. First, it is necessary to define the specifics of the state as a specific economic entity.

Secondly, a description of the place of the state in the system of economic relations, in their structure, should be given, since this determines the hierarchy in the system of economic entities.

Thirdly, it is necessary to correlate the state with the general social forms of economic entities as an individual, group, society, to answer the question of which (which) subject (subjects) the state personifies as a specific economic entity.

Fourth, the most important direction in the study of this problem is the place of the economic interest of the state in the system of economic interests, the disclosure of economic contradictions as a meaningful form of interaction of mismatched economic interests.

Fifth, it is necessary to clarify the economic functions of the state in the modern economy, to identify and study new trends in the development of macro-regulation of economic life, due to both the internal logic of the development of the modern economy and the processes of globalization. In connection with the foregoing, let us dwell on some points.

The state as a subject of economic relations is a set of organizations endowed with the right and duty to establish and protect the conditions of economic activity that are mandatory for other market entities and redistribute the results of their activities.

The state is a special case of power relations that arises on the basis of the transfer by citizens of part of their rights to control their activities, therefore the state and its bodies have the right to coercion within the framework and on the basis of laws. From the point of view of the structure of economic relations, which in turn determine the structure and subordination of economic entities, the following classification of economic entities is carried out in the literature: subjects of primary and secondary economic relations, subjects of the main production relationship and its reflected forms, etc.

It seems that the state can now be attributed to the main economic actors, since it is the subject, or "mediates" the movement of almost any economic relationship. In addition, it should be borne in mind that the state is a supplier of pure public goods, many of which act as a kind of economic resources used in sectors of the economy.

There are ***two main forms of state intervention in the economy***:

– direct interference through administrative means, which are based on the power of state power and include measures of prohibition, permission and coercion;

– indirect intervention through various economic policy measures and its priorities.

Measures of administrative and administrative management are based on coercion, prohibitions, restrictions: the object of management is obliged to follow the instructions of the subject, regardless of their own will and desires, in case of failure to comply, the guilty persons are subject to punishment. Such management is typical for a centrally controlled economy, but in a wide variety of manifestations, administrative management is also inherent in a market economy, with the only difference being that in the latter, command principles do not appear on such a large scale and in such an obvious form as in an economy controlled from a single center. .

The most striking expression of these methods of public administration is considered to be state directive planning, under which resources are centrally distributed to enterprises and plan targets are set by state authorities, which took place in the Soviet economy. In one form or another, directive planning has taken place and is taking place in many countries of the world.

All the "tigers" of Southeast Asia had and now have five-year plans – directives with various details of the development of their economies. In conditions of limited financial resources, this is the only way to distribute them according to the country's development priorities, which often do not give a quick return.

In China and Vietnam, the forms of administrative and administrative methods are of paramount importance, and this explains the success of economic reforms. In Belarus, the recovery period of the economy was carried out mainly thanks to the administrative resource of the country's leadership.

The tools of administrative and administrative management at the macro- and microeconomic levels are laws, rules, norms, regulations, instructions that apply to economic objects, processes, relations. The standards of quality, ecology, labor protection, established and supported by the state authorities, requiring strict observance, are also manifestations of administrative management by state bodies.

At the macroeconomic level, in a market economy, economic and financial plans, programs, budgets become an instrument of administrative management to the extent that they are mandatory and binding, obviously require execution by bodies, organizations, persons that are responsible for compliance with the decisions made.

Among the state administrative and administrative influences are mandatory regulations, instructions, rules and norms of economic behavior, the procedure and forms of state reporting. These establishments state bodies are obliged to inform those organizations, establishments, persons on which actions of directives of the state power extend. These instructions may be disseminated through the media.

The main feature of administrative and administrative control is the obligatory fulfillment of the control action of the subject of management by the circle of persons to whom it is addressed, this implies the right to apply certain forms of coercion in relation to bodies and persons who do not comply with the instructions with the use of fines, sanctions, punishments in a variety of ways. forms.

At the same time, the state must guarantee the executors of its will from excessive risk, from responsibility due to strict observance of state decisions.

Administrative and administrative management, like any other method of management, has both certain advantages and disadvantages, which manifest themselves depending on how, by whom, when this method is applied.

Germany can serve as a good example in this case, where this method is applied reasonably and prudently, where there is high professionalism, responsibility and incorruptibility of officials. At the same time, criminal liability was introduced for causing harm to business entities. The main goal of the activity of the entire state apparatus, all branches of government, is the successful, long-term and sustainable activity of enterprises in the real sector of the economy.

Economic motivation acts as a universal method of management, based on the motives and interests of people and organizations, stimulating the economic interest of the object of management in the implementation of control actions. Economic methods are closely related to administrative methods in the sense that the state determines and assigns a system of economic incentives and ways to apply it. Only after that, state economic incentives acquire an independent existence and turn into an indirect form of state administration, based on market mechanisms of self-motivation. After that, well-established economic market mechanisms are able to function without government intervention.

In the context of the operation of economic methods of management, the administrative influence along the vertical "top-down" loses its dominant importance and means a transition to management "horizontally". Prerequisites are being created for the transition to self-government of organizations, enterprises, farms, entire industries and regions. This means that in the system of state management of the economy, free contractual relations, accepted obligations of equal business entities are significantly increasing.

The state acts as an agent of economic activity in the framework of its relations with other participants, organizations, enterprises, entrepreneurs - it builds these relations on a contractual basis, on the principles of equality, equal benefit and equal responsibility for fulfilling the obligations assumed. Nevertheless, the role and place of the state remains special, significantly more significant in comparison with other subjects of management.

– only the state determines the most common for all economic agents regulatory conditions for mutual relations, called the rules of the "economic game";

– the state is the richest, most powerful, resource-provided participant in economic activity;

– the state has an "administrative resource", which is much superior to the similar resource of other participants;

– and, lastly, the state, representing the interests of the whole society, sets the rules of the game in institutional, structural policy, in the monetary sphere, ie. creates the "foundation" and "framework rules" of economic activity.

Let us consider the most significant economic methods used in the practice of the role of the state in the economy as levers of influence of the state on participants in economic activity with the aim of steady economic growth.

The first and dominant one is monetary policy, since it most significantly affects all three factors of economic development: capital, labor, and innovation.

The capital of society can be successfully accumulated only if the state maintains such framework conditions.

– inflation is either 0 or 1–2 % per year;

– the exchange rate is set according to the priority of purchasing power and fluctuates within 1–2 % per year from it;

– money supply is equal to GDP;

– the mass of credit resources generated by the banking system per year is equal to GDP;

– stock market capitalization of at least 60 % of GDP;

– currency convertibility regime corresponds to the economic situation;

– profitability of the real sector – 30 % and above.

This area also includes the fiscal policy of the state, which should have the only main task - to ensure the sustainable operation of enterprises in the real sector so that they are competitive in the world market.

This is the basis for solving social problems, unemployment, sustainable and decent spending on health care, education, defense, etc. For this:

– sufficient funds should be invested in infrastructure (logistics, informatics, communications, roads), as a result of which the prices and quality of services should correspond to the best world analogues;

– spending on science and, above all, on fundamental science, should be at least 3–4 % of GDP;

– to support entrepreneurship, organize internal borrowing in the amount of 60 % of GDP, which will make it possible to provide preferential loans to businesses for priority areas at 1–2 % per annum;

– to reformulate interbudgetary relations between the center and the regions according to the system of 20 % + 80 % and gradually give the regions the corresponding revenue and expenditure parts, which will significantly increase entrepreneurship in small and medium-sized cities;

– tax policy should provide for tax holidays for new enterprises from 1 to 5 years, lower income taxes;

– to invest significant budgetary funds in creating conditions for the emergence of new (5–6) technological modes.

These basic methods should be supplemented by many other measures of an economic nature that would make it possible to create at least 35–40 thousand enterprises per 1 million inhabitants and create up to 5 powerful financial and industrial groups according to the number of megatechnologies of the sixth technological order, which have a scientific and technical backlog in the Republic of Belarus.

Such an economic policy will reduce the tactical burden on the state apparatus and allow them more time to deal with strategic concepts and programs with a horizon of 30–50 years.

I would also like to dwell a little on the socio-psychological methods of state regulation. First of all, it is necessary to educate among citizens the desire to take their own destiny into their own hands, to become a self-sufficient economic agent with properties that are characteristic of modern requirements. The ability to perform highly skilled labor, to have a certain intellectual capital, gave rise to a situation where the factor "labor" acquired a new meaning, meaning.

In the amount of capital of foreign forms, 80 % carries an intellectual potential, i.e. the cost of personnel and technologies, the carriers of which he is. The socio-psychological method, along with others, should be used in the fight against brain drain, as is effectively used in Japan, China, Korea and other countries.

In practice, a reasonable combination of all forms and methods of the role of the state in the economy is used, depending on the circumstances.

10.3. THE OBJECTIVES OF ECONOMIC POLICY

Depending on the specific economic situation, the goals of economic policy can and should change, respond flexibly to the actual correlation of the economy and its problems.

Several general goals of economic policy in a market economic system can be formulated.

1. The goal of economic growth. This is a common end goal for every national economy in market conditions and in transition economies. Such a goal is specified in the volume of GNP production, the standard of living of the population.

Economic policy in such conditions is aimed at activating:

– investment processes;
– economic restructuring;
– effective employment;
– growth of labor productivity;
– sufficient solvent demand of the population, etc.

2. The goal of effective employment. As a rule, it is connected with the first goal and provides for an active economic policy of the state.

3. The goal of growth in economic activity. Achieving this goal provides for long-term and strategic plans for the development of the national economy. The basis of such plans is the development of scientific and technical progress, education, science, the development of the national economy in the system of the international division of labor. Here the means of industrial policy are used.

4. The goal of a stable price level. In a transitional economy, this goal is achieved by supporting the national producer. In a developed market economic system, this goal is achieved by means of monetary and budgetary policy, which have an anti-inflationary focus.

5. The purpose of protecting and supporting a specific economic order, the principles of economic freedom. It is achieved by means of antimonopoly policy, control over the use of economic power, protection of human rights and private property. Such a policy comes into conflict with the principles of an active state economic policy of state regulation.

6. The goal of social security and stability. It is achieved by means of social insurance, effective employment, progressive taxation of personal incomes of the population.

10.4. THE TEMPORARY LAGS OF ECONOMIC POLICY

In an open economy, policy is formed, subject to the goals of internal and external balance. At the same time, internal equilibrium implies:

1) full use of the country's resources;
2) stability of the level of domestic prices.

External equilibrium is achieved when the country's current account balance is in a good intermediate position, that is, when there is no deep deficit that the country will be unable to repay its debt in the future, and there is no significant surplus where foreign borrowers cannot repay their debts. The division into internal and external goals is conditional: for example, employment in export sectors affects both domestic employment, export growth, and the ability to pay external debts.

An excessive current account deficit (a country borrows abroad) does not pose a problem if the borrowed resources are directed to productive domestic investment projects that will generate income in the future. But a deficit can mean a temporary high level of consumption, coming from misguided policies and a disruption in the functioning of the economy.

A deficit caused by an expansionary fiscal policy that has failed to produce profitable investment projects may signal the need to restore external equilibrium by changing the economic course. Recently, some countries are facing the problem of limiting the receipt of loans abroad, foreign lenders are unwilling to issue new loans without repaying the old debt.

An excessive excess of the current account balance poses other problems. Thus, for a given level of savings in the country, an increase in the balance sheet surplus implies a reduction in investment in national production, where savings break down into foreign assets and domestic investment. Since the excess involves the accumulation of assets abroad, it is necessary to interest investors in domestic investment through:

1) a progressive tax system;

2) increasing the competitiveness of domestic enterprises so that the gain from domestic investment is greater than foreign ones.

The surplus reflects excessive borrowing made by foreigners, which cannot always be repaid in time.

Thus, the objective of the external equilibrium should be the level of the current account that allows to receive the benefits from international trade with the least risk.

In this regard, the question arises about the specifics of the stabilization policy. Proponents of active economic policy believe that in the absence of clear programs in the conduct of monetary and fiscal policies, the economy will be affected by shock shocks and related fluctuations in employment and output.

Proponents of passive economic policy argue that efforts to stabilize the economy backfire because both monetary and fiscal policies operate with long time lags.

Decision lag is the time gap between the moment of realizing the need for action and the moment of making a political decision. There are two types

of stabilization policy lags. The internal lag is the time from the moment of shock to the moment a decision is made to carry out specific stabilization measures. The external lag is the period of time from the adoption of economic policy measures and the time for obtaining results from the proposed and implemented measures "adoption".

The internal lag is longer for fiscal policy than for monetary policy.

External lags are longer for monetary policy than for fiscal policy. The mechanism of action is based on the influence of fluctuations in interest rates on investments. Since many enterprises plan investments in advance, the results of investments in real output, due to changes in monetary policy, can be expected only after a long period.

The lag analysis showed that policy actions require careful preparation and calculation of the expected consequences, as well as the choice of the optimal strategy in each specific case.

10.5. ACTIVE AND PASSIVE ECONOMIC POLICIES

One of the most important problems of the normative theory of economic policy is the definition of the nature of the policy, the degree of state intervention in the economy. An active policy implies an active response to the problems that arise in the process of functioning of the economy. It is based on the application of stimulating or restraining policies, depending on the specific situation. Its shortcomings: the problem of time lags, reliable information, political interests. A passive economic policy presupposes reliance on the self-adjusting forces of the market system. It is based on the creation of automatic stabilizers. Her instruments are mostly quality instruments.

Actions according to circumstances and actions according to rules.

Depending on which methods of achieving goals are recognized as effective, they distinguish: The policy of action according to circumstances is a policy in which the government optimizes its actions at every given moment of choice. This policy may be optimal for a particular moment, but not optimal in the long run.

Result: expectations of repeated benefits, kickbacks, disorientation of the economic entity. The policy of action by the rules ("hard line") involves the choice of a plan or rule that will achieve the desired goal, and then strictly follow this plan, regardless of circumstances.

Result: this approach is optimal in the long run, as business entities perceive stable "rules of the game" and build their own strategy. Advantages of "playing by the rules" over arbitrary politics:

– the risk of making incompetent decisions, which are often fed by imperfect information, is reduced;

– the impact of the political business cycle on cyclical fluctuations in employment, output and inflation is reduced;

– conditions are emerging for the growth of trust in the government.

Positive economic policy theory explains why governments act the way they do. Her main generalizations are:

1) state actions give rise to a political business cycle: a stimulating policy is usually carried out before the elections, after – a stabilization policy. It shakes up the economy;

2) in countries where political power often shifts from one competing party to another, there is a bias towards expansionary fiscal policy;

3) politicians are usually guided by short-term interests. The implementation of future-oriented measures depends on the measures and methods of public control over the activities of the government.

10.6. DISCRETIONARY POLICY AND POLICY ACCORDING TO THE RULES

A policy that assumes that the choice of political measures, their scope and timing of adoption is left to the discretion of the politicians themselves. This policy should be distinguished from rules-based policy, where politicians either adhere to pre-announced rules of the game or constantly make decisions based on established precedents. The unpredictable actions of the monetary and fiscal authorities become additional a source of shocks in the economy and, therefore, are more of a destabilizing factor than a stabilizing one. In turn, supporters of discretionary policy argue that the developed rules allow you to cope only with those violations in the economy that can be foreseen. Many economists doubt that the current level of understanding of how the economy works is sufficient to formulate rules of conduct; thus, politicians should enjoy considerable freedom of choice.

Different types of policies are based on different concepts - discretionary policy involves Keynesian regulation (active intervention), and automatic and based on the rules of neoclassics and M. Friedman (with regard to monetary policy) - indicators of the monetary sector, regulated by the Central Bank),

Discretionary policy appears when, for example, the Central Bank, unexpectedly for economic entities or without clear rules for changing the interest rate, raises or lowers it. When increases the money supply (arranges for inflationary shocks), or the government sharply increases the volume of public procurement (for fiscal policy). In general, the state acts at its own discretion with a discretionary policy, without binding itself to strict rules for the application of a particular instrument.

The process of formulating monetary policy objectives consists of the following stages.

At the first stage, the ultimate goals of monetary policy are set in the form of target figures for economic growth, inflation, and the state of the balance of payments.

At the second stage, intermediate goals of monetary policy are determined in the form of specific quantitative monetary indicators. The most important monetary indicators in the Republic of Belarus include: net domestic ruble credit of the National Bank, ruble monetary base, ruble money supply, gross ruble loans of banks, net foreign assets of the monetary authorities, net emission of the National Bank.

At the third stage, the operational objectives of the monetary policy are set. The range of monetary indicators that are subject to the influence of the central bank is determined (for example, interest rates set by the central bank, prudential supervision norms, central bank reserves, etc.)

In all countries, the interest rate band stabilizes the overnight segment of the money market. In addition to it, the central bank can maintain an interest rate corridor on longer market segments – for example, two days (Brazil), a week (Iceland), two weeks (Indonesia), a month (South Korea, New Zealand). As a rule, as the money market develops, the segment in which the central bank stabilizes the market gradually shifts towards "overnight".

The interest rate policy within the corridor can take three forms: a symmetrical and asymmetric corridor, as well as a corridor without a guideline. A classic example of a symmetrical interest rate band is the Swedish money market. The lower limit of the corridor is formed by the overnight deposit rate of the Riksbank, and the upper limit is the rate on its overnight loan. The boundaries are set at an equidistant distance from the center of the corridor ±0.75 %.

An example of an asymmetric interest rate band can be found in the Icelandic money market. The Central Bank of Iceland uses standing operations to maintain an interest rate band in the overnight and seven-day segments. In the overnight segment, it accrues interest on the current accounts of credit institutions with the central bank, and also issues overnight loans. In the seven-day segment, the Central Bank of Iceland, on the one hand, accepts deposits and issues certificates of deposit, and, on the other hand, issues loans secured by securities.

Finally, the last option is a corridor without a clear percentage target. The central banks of Norway, Indonesia and the Czech Republic do not set the interest rate, which acts as a benchmark for the market within the corridor. In an alternative interpretation, it can be one of the interest rates that form the border of the corridor. In Norway, for example, it is the deposit rate.

10.7. THE POLITICAL CYCLE OF BUSINESS ACTIVITY. INCONSISTENCY IN ECONOMIC POLICY

Macroeconomic instability: fluctuations in economic activity (economic cycles), the emergence of unemployment, underutilization of production capacities, inflation, state budget deficit, foreign trade deficit – are characteristic of a market economy. Macroeconomic instability in many areas reduces the efficiency of the economy. For example, unemployment means a shortfall in production, and an increase in unemployment by 1 % means a reduction in economic growth by 2–3 %. The market economy is based on private ownership of the means of production. Millions of manufacturers are isolated from each other, each of them acts at his own peril and risk, each in his own way assesses the scale of demand and determines the volume of production. The spontaneity of economic development predetermines the possibility of a mismatch between supply and demand, the possibility of underutilization of society's resources (labor, equipment). In a market economy, economic development is uneven, a period of rapid economic growth and inflation is replaced by an economic recession with high unemployment. In other words, economic development occurs in the form of economic cycles, or business cycles. The state is making efforts to stabilize the economy, aimed at achieving full employment, price stability, maintaining stable economic growth rates. This is achieved through the government's macroeconomic policy, which includes fiscal, monetary and foreign economic policies. Thus, macroeconomic instability, being a disadvantage of a market economy, leads to the emergence of such an area of state intervention as macroeconomic policy.

QUESTIONS

1. What is stabilization policy?
2. Why do we need a stabilization policy?
3. What are the advantages of fiscal policy?
4. What are the disadvantages of fiscal policy?
5. What are the two types of economic models?
6. What are two main forms of state intervention in the economy?
7. What are the general goals of economic policy in a market economic system?
8. What is macroeconomic instability?

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Ответственный за выпуск *Т. М. Турчиняк*
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