National University of Life and Environmental Sciences of Ukraine

Department of Economic Theory

ECONOMICS: MACROECONOMICS

Methodical instructions
for undergraduate students training

Field of knowledge 07 Management and Administration
Specialty 073 Management
Academic programme “International Business Management”

KYIV - 2024

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Themes are offered and to the test of question, that allows to check up the knowledge of discipline.

A manual is made to order the students of higher educational establishments for independent and interactive preparation.

Description of the discipline ECONOMICS: MACROECONOMICS

Academic degree, specialty, academic programme		
Academic degree	*Bachelor's*	
Specialty	*073 Management*	
Academic programme	*International Business Management*	
Characteristics of the discipline		
Type	*Compulsory*	
Total number of hours	*150*	
Number of ECTS credits	*5*	
Number of modules	*2*	
Course project (work) (if any)	-	
Form of assessment	*Exam*	
Indicators of the discipline for full-time and part-time forms of university study		
	Full-time	Part-time
Year of study	1	
Semester	2	
Lecture	*45 hours*	
Practical classes and seminars	*45 hours*	
Laboratory classes	-	
Self-study	*60 hours*	
Number of hours per week for full-time students	*6 hours*	

1. Aim, objectives, competences and expected learning outcomes of the discipline

Aim. The purpose of studying the discipline is to provide students with in-depth theoretical knowledge of the problems of the functioning of the economy - an important sphere of human life, the effects of objective economic laws, familiarization with the methods and conditions of effective management, and a comprehensive systematic understanding of macroeconomic theory and policy.

Objectives

- to evaluate economic effectiveness and national economic indexes/
- to analyze economic relations and economic events/
- to learn economic categories and economic laws/

Acquisition of competencies:

Integrated competency (IC):

The ability to solve complex specialized tasks and practical problems, which are characterized by complexity and uncertainty of conditions, in the field of management or in the learning process, which involves the application of theories and methods of social and behavioral sciences.

General competencies (GC):

GC 3. Ability to abstract thinking, analysis, synthesis.

GC 10 Ability to conduct research at the appropriate level.

Special (professional) competences (SC):

SC 1. The ability to define and describe the characteristics of the organization.

SC 3. The ability to determine the prospects for the organization's development.

SC 11. Ability to create and organize effective communications in the management process.

SC 16. Ability to identify and analyze new market opportunities, including the international business environment, formulate new ideas, develop projects and organize business process management.

SC 17. The ability to assess and analyze the export potential of the enterprise and forecast its growth directions.

Expected Learning Outcomes (ELO):

ELO 5. Describe the content of the functional areas of the organization.

ELO 18. Demonstrate the ability to identify prospects for enterprise development, develop projects, organize business process management based on the analysis of market opportunities and the international business environment.

ELO 19. Assess and analyze the export potential of the enterprise and forecast its growth directions.

Economics, at its best, is a set of ideas and methods for the improvement of society. It is not, as so often seems the case today, a set of ideological rules for asserting why we cannot face the challenges of stagnation, job loss and widening inequality.
Christopher Sims,
Nobel Laureate in Economics 2011

MACROECONOMICS AS A SCIENCE

Introduction to macroeconomics

Macroeconomics is a science that studies conformities to natural laws of economy functioning in general. But economy is a complicated system. That's why besides macroeconomics economy is studied by other economic sciences: political economy, microeconomics, marketing, management, trade and functional economies etc. First of all Macroeconomics as a science is based on regulations and conclusions of political economy about development of production relations, broadened recreation, action of objective economic laws and mechanisms of their use in practice of management. It has also a net link with mathematics and statistics, it widely uses methods of economic-mathematical modeling that makes it an exact science and allows to pass from qualitative to quantitative analysis of economic phenomena, processes and conformities to natural laws that take place in economy. So, macroeconomics forms scientific conceptions about economy functioning on national level. Analysing basic factors and consequences of macroeconomic development this science offers methods of active influence on object of its research, that’s why on process of broadened recreation. Without determining the content of economic state policy, macroeconomics is always used as its theoretical base. This states that it doesn’t make researches only in factual state of national economy but also allows to suggest different variants of influence on economic development process.

As in any economic science a fundamental contradiction of human society lies in macroeconomics base: contradiction between material needs of people and those economic resources that people have for their satisfaction. The essence of this contradiction is that material needs of people are unlimited and economic resources necessary for their satisfaction - limited. The peculiarity of macroeconomics is that this contradiction is considered from the position of not separate subjects of economic activity (physical or juridical persons), but of all aggregate economic subjects, so of national economy as the whole. Usually macroeconomics can’t be neutral to this contradiction. It is as other economic sciences to be one of instruments of its resolving.

***Macroeconomics**: the study of the economy as system in which feedbacks among sectors determine national output, employment and prices.*

Object and subject of macroeconomics

To determine the object of macroeconomics as a science, it is necessary first of all to distinguish macroeconomics and microeconomics. Microeconomics studies functioning mechanism and interrelations of separate economic subjects to which enterprises and organizations (firms, commercial banks etc.) belong.

***Microeconomics**: the study of individual behaviour in the context of scarcity.*

Macroeconomics studies economic activity and interaction of the aggregate of economic subjects, so national economy as the whole. So, macroeconomics formulates scientific conceptions about functioning of economic system on national level. Internal state and functioning of economic system as the whole are provided by links between elements entering to its structure and by external environment.

But in reality there is no economy at all, but economy always exists as that one with correspondent type of production relations that form an adequate economic system. This means that the object of macroeconomics is not simply a national economy in general, but its correspondent type, historically determined economic system.

Considering development of economic systems in historic aspect, there can be determined three basic types: market, command-administrative and mixed economy.

Market economy is characterized by private property form of economic resources and use of market mechanism for economy regulation. The main force of market economy is concurrence. A concurrence economy is the economy where a consumer rules. This economy type is frequently considered as the best economic system, when state interference in economic processes becomes unnecessary. Government role in this type is ought to be limited by defense of private property and establishment of favorable legal field for free market functioning.

Command-administrative (planned) economy is straightly opposed to market economy. It is founded on state property and regulation of economic processes is made by central state planning.

Mixed economy is such economic system, which combines different property (private, cooperative, state) forms and two mechanisms of macroeconomics' regulation: market and state. Howeve, in each country with mixed economy correlation between market and state regulation, or distribution of regulative functions between market and state, is unequal.

***Mixed economy**: goods and services are supplied both by private suppliers and government.*

There are three most typical models of mixed economy: american, japanese and swedish.

The base of american model is a system of business encouragement, personal success achievement, enrichment of the most active part of population. Active

interference of the state in economy is typical for japanese model. Typical peculiarity of swedish model is its social orientation on the level of state policy.

The subject of macroeconomics is a mechanism of functioning of economic system. Macroeconomics on one hand has to study real facts and find out reasons and consequences links in economic mechanism and on the other hand it has to recommend tools to improve economic mechanism in order to use more effectively existing resources and to reach a higher level of social needs satisfaction. So, macroeconomics does not have only a distinguishing function but also a normative one. Macroeconomics dealing with a distinguishing function, i.e. studying stable links and dependences appropriate to national economy is called positive or macroeconomic analysis. Meanwhile it studies subjective approaches of recommendation character such as theories, concepts and models aimed to solve definite problems of national economy development, this macroeconomics is called normative, or macroeconomic regulation.

History of macroeconomic science development

Macroeconomics is one of the youngest economic sciences. As generally acknowledged it reached its maturity in the 30-s of the XX-th century, in the period of the world economic crisis, when it gained the ability to influence an economic practice.

But macroeconomic science takes its beginning in XVI-th century. In 1576 a frenchman Jean Bodein proved price level change (inflation) as a result of change of correlation between quantity of money and goods. These were first attempts of macroeconomic analysis of prices using quantitative theory of money. This theory - became the base of contemporary monetary theory.

Researches of English economists V.Petty and G.King also had a macroeconomic orientation, they were the first in world practice who made calculations and gave estimation of national income of England and France 300 years ago. First estimations of national income of England made by V. Petty previewed concrete practical aims. The scientist studied questions of influence of tools and methods connected to improvement of tax system in a country on economy and incomes distribution.

Further a macroeconomic analysis was developed in the XVIII-th century in works of french school of phisiocrates. A Founder of this school Francois Kene developed a macroeconomic model of economy turnover, so called “Economic table” (1758). This table reflected a general picture of turnover of goods and services for principal economy sectors and society grades and gave conception about mechanism of economy functioning as the whole. But it used concepts that were not proved by time. Kene was both a doctor and an economist. That's why its model of economy turnover is based by parity of blood cycle of a man.

By parity of human organism Kene subdivides society in three classes: productive (peasants), prosperious (landlords) and sterile (artisans). These classes according to F. Kene theory exchange results of their labor and in that way they reproduce themselves, their productive force.

Developing the “Economic table” Kene used two principles:

1. Economy turnover is to be based on natural economic order without external state interference. So, F. Kene was an adherent of economic liberalism.

2. Analogy of economic processes to blood circulation pushed Kene to think about possibility of determined violations in economy turnover, up to appearance of crisis phenomena by analogy to cerebral or coronary thrombosis.

Kene anticipated possibility of inflationary augmentation of streams cost of economic turnover. The most dangerous point was to his opinion a level rise of consumption of luxury goods bought at sterile class by prosperious class.

The principal disadvantage of Kene’s “Economic table” was that it didn’t explain how in economy “natural laws" are provided, the scientist did not show the mechanism of self-regulation of market system.

This question is answered by the representatives of classic theory. According to classic theory the ability of market to self-regulation is guaranted with help of the mechanism of price making. The most prominent representative of this theory was Adam Smith. He considers two prices: natural one that covers costs and gives a middle market income norm, so called factual price at which a commodity is sold on the market. A regulative role of price is explained in this point as follows.

Influence of competition and dependency on demand and supply correlation cause market price up or down deviation from natural price. If demand is higher than supply and market price deviates up from natural one, then in the industry where a given commodity is produced income is higher of a middle norm. This makes economic subjects remove their capital into more profitable industry. And on the contrary, if demand is lower than supply, market price is lower than natural one and income is lower of a middle one, then the capital is withdrawn from a low profit industry.

The above-mentioned shifts of capital provide equilibrium in economy, so such allocation of resources between industries corresponds to public needs. In given capital redistribution each cares only of own interests that consist in obtaining the highest income. But by this action each satisfies public interests not realizing that. So, market provides reaching a macroeconomic equilibrium automatically through price mechanism.

Marxist theory offers a contrary approach to estimation of regulative market possibilities. K. Marx developed two models of economic turnover – the models of simple and broadened recreation. He concluded that in conditions of permanent stocking of capital income norm has a tendency to lowering (law of tendency and income norms to lowering). To Marx opinion these circumstances deprive capitalists of desire to convert unconsumed part of additional value into investment. Consequently, it breaks the process of economic turnover, causes production shortage, arises a crisis and impoverishment of people takes place that after all destroys a capitalist market system.

Marx macroeconomic ideas were acknowledged only in socialist countries. Macroeconomics began its development according to classic theory. But the world economic crisis in 1929 -1933 didn’t confirm basic postulate of classic theory - ability of market economy to fast self cerement that caused in confidence to it. There

appeared necessity of new macroeconomic theory. An English economist Jon Manard Keyns became its founder and his theory was named in his honor – Keyns. Keyns criticized a classic theory. If classics affirmed that markets prices are capable to install equilibrium in economy automatically and that's why state interference in economy is not necessary, then Keyns was the first to submit the idea that market equilibrium is not the only well for economy yet. He proved that in market economy can be “equilibrium at incomplete employment" and that for its removing a state intervention is necessary. Keyns considers basic levers of such interference financial and monetary policy and the object of influence was an aggregate demand according his thoughts. Keyns exposed his thoughts regarding the problems of market economy regulation in the book “General theory of employment, percentage and money” (1936), where he demonstrated that state influence, can effectively realize economy regulation on definite macroeconomic indexes such as total revenue, consumption, investments, savings etc.

In this period an English scientist K. Klark, an American economist of Ukrainian origin S.Kuznets, an American scientist A.Gilbert, an American economist of Russian origin V. Leontyev and others pointed out considerable ideas in the development of macroeconomic theory and practice, especially macroeconomic analysis. In their works they exposed in theory structure and content of important macroeconomic indexes such as national product, revenue and wealth’s, gross issue, calculated them; concretized a number of statements as for estimations of non-market services of state management organs, conceptions of final and intermediate consumption and regulation of economy on national level.

However, in the period of new world economic crisis of 70-s of the XX-th century it turned out that state interference in economy does not always give expectative positive result and that state influence on aggregate demand in the period of economic activity collapse does not provide a production increase, but gives birth to inflation. It was for the first time in world practice that appeared such phenomenon as stagnation when production decrease and prices growth have place simultaneously.

At this point “neoclassical" theory started developing intensively. A neoclassical theory appeared in 70-s of the XIX-th century. It’s appearing, on one hand, was a reaction on marxism with its capitalism criticism, on the other it was an attempt to introduce new statements and conclusions proving self-regulation function of market into neoclassical theory. The neoclassical theory has a plenty of different trends. Consequently, a welfare theory was the first to introduce notions of “social well” and “external effects of monopoly” with which a market can’t cope without a state help into scientific cycling. The theory of state finances of P. Samualson is based on the above-mentioned notions. So, a neoclassical school appeared as reaction to disadvantages of Keyns’ theory. It includes a number of theories contradicting Keyns’ theory. Now there can be distinguished monetary theory, theory of rational waiting, supply economy theory and others. Each of them has both advantages and disadvantages. The idea that the main role in economy regulation belongs to money-credit and not to fiscal policy lies in base of the monetary theory exposed by an American economist Milton Fridmen. According this theory the basic instrument are money. Increasing or decreasing money supply a state can realize regulative

influence on economic activity. However, some scientists from the USA (Feldstain, G. Guilder and A. Laffer) think that deep violations of economic growth and employment can not be explained only by aggregate demand that is insufficient for use of production potential as Keynes representatives affirm, or by regulation of money mass as monetarists affirm. The reason of this, to their opinion, is underestimation of aggregate supply. By increasing taxes, social payments and guarantees a state advances extra demands for adaptation of market economy mechanism, as a result individual initiative and market flexibility are essentially diminished. Through tax mechanism fiscal policy can influence an aggregate supply and consequently a real volume of production.

So, contemporary macroeconomics does not have the only dominating theory. It is based on a number of theories that fill one another and give possibility of choice in order to define effectiveness of each theory depending on subjective conceptions and taking into account individual conditions, aims and priorities of economic policy of a concrete country.

Part One: B*asis of macroeconomics and it basic indexes*

Chapter 1
Subject, methods and functions of macroeconomics

In this chapter we will explore:
1. Subject and functions of macroeconomics
2. Economic systems and their types.
3. Macroeconomic subjects and their interaction.
4. Methods of macroeconomic analysis. Static and dynamic macromodels.

1. The subject of macroeconomics

Macroeconomics studies essence, results and consequences of common economic activity of all participants of national economy.

Specific task of macroeconomics is a cognition, arrangement and explanation of processes that are conditioned by functioning mechanism of national economy as the whole.

There are two levels of macroeconomic analysis:

ex post – national accountancy;

ex ante – forecast modulation.

Ex post analysis is based on macroeconomic parameter definition of the past period with purpose to get information how national economy functioned and what results are obtained. On the basis of the results of ex post analysis macroeconomic concepts are corrected and new concepts are developed.

Ex ante analysis is a forecast modulation of economic events and processes on the base of some theoretical concepts. The purpose of ex ante analysis is to assess which factors and by what means will influence significance of macroeconomic indexes in the future.

The object of macroeconomic analysis is economic system as the whole and its aggregate parameters.

Principal functions of macroeconomics are:

- Theoretically-cognitive function means researches of economic processes on macrolevel and construction of the models of these processes.
- Practical function means developing of practical recommendations on the base of an economic process (theoretical base of economic policy).
- Educational function –macroeconomics should develop a new type of economic thinking and form a contemporary world view of a person.

2. Economic system

An economic system is a means by which societies or governments organize and distribute available resources, services, and goods across a geographic region or country. Economic systems regulate factors of production, including capital, labor,

physical resources, and entrepreneurs. An economic system encompasses many institutions, agencies, and other entities.

Types of Economic Systems

There are many economies around the world. Each has its own distinguishing characteristics, although they all share some basic features. Each economy functions based on a unique set of conditions and assumptions. Economic systems can be categorized into four main types: traditional economies, command economies, mixed economies, and market economies.

1. Traditional economic system

The traditional economic system is based on goods, services, and work, all of which follow certain established trends. It relies a lot on people, and there is very little division of labor or specialization. In essence, the traditional economy is very basic and the most ancient of the four types.

Some parts of the world still function with a traditional economic system. It is commonly found in rural settings in second- and third-world nations, where economic activities are predominantly farming or other traditional income-generating activities.

There are usually very few resources to share in communities with traditional economic systems. Either few resources occur naturally in the region or access to them is restricted in some way. Thus, the traditional system, unlike the other three, lacks the potential to generate a surplus. Nevertheless, precisely because of its primitive nature, the traditional economic system is highly sustainable. In addition, due to its small output, there is very little wastage as compared to the other three systems.

2. Command economic system

In a command system, there is a dominant, centralized authority – usually the government – that controls a significant portion of the economic structure. Also known as a planned system, the command economic system is common in communist societies since production decisions are the preserve of the government.

If an economy enjoys access to many resources, chances are that it may lean towards a command economic structure. In such a case, the government comes in and exercises control over the resources. Ideally, centralized control covers valuable resources such as gold or oil. The people regulate other less important sectors of the economy, such as agriculture.

In theory, the command system works very well as long as the central authority exercises control with the general population's best interests in mind. However, that rarely seems to be the case. Command economies are rigid compared to other systems. They react slowly to change because power is centralized. That makes them vulnerable to economic crises or emergencies, as they cannot quickly adjust to changed conditions.

3. Market economic system

Market economic systems are based on the concept of free markets. In other words, there is very little government interference. The government exercises little control over resources, and it does not interfere with important segments of the economy. Instead, regulation comes from the people and the relationship between supply and demand.

The market economic system is mostly theoretical. That is to say, a pure market system doesn't really exist. Why? Well, all economic systems are subject to some kind of interference from a central authority. For instance, most governments enact laws that regulate fair trade and monopolies.

From a theoretical point of view, a market economy facilitates substantial growth. Arguably, growth is highest under a market economic system.

A market economy's greatest downside is that it allows private entities to amass a lot of economic power, particularly those who own resources of great value. The distribution of resources is not equitable because those who succeed economically control most of them.

4. Mixed system

Mixed systems combine the characteristics of the market and command economic systems. For this reason, mixed systems are also known as dual systems. Sometimes the term is used to describe a market system under strict regulatory control.

Many countries in the west follow a mixed system. Most industries are private, while the rest, comprised primarily of public services, are under the control of the government.

Mixed systems are the norm globally. Supposedly, a mixed system combines the best features of market and command systems. However, practically speaking, mixed economies face the challenge of finding the right balance between free markets and government control. Governments tend to exert much more control than is necessary.

Economic system is an ordered system of connections between producers and customers of material and nonmaterial goods and services.

The base elements of economic system are

- Concrete economic links between economic subjects.
- Socioeconomic relations that are based on correspondent forms of property on economic resources and results of economic activity.
- Organizational forms of economic activity: labour division, specialization and cooperation of production.
- Economic mechanism, i.e. a mean of regulation of economic activity on macrolevel.

Economic systems are multilevel and formally are written so:

$$\mathbf{ES = f(A_1, A_2, ..., A_n)}$$

ES – economic system that is determined by properties.

These properties are criterions while defining a type of economic system.

The *object* of macroeconomic analysis is characterized by aggregate indexes.

Aggregate indexes reflect the aggregate of specific economic units in such a way that they form the whole.

Final Word

Economic systems are grouped into traditional, command, market, and mixed systems. Traditional systems focus on the basics of goods, services, and work, and they are influenced by traditions and beliefs. A centralized authority influences command systems, while a market system is under the control of forces of demand and supply. Lastly, mixed economies are a combination of command and market systems.

3. Macroeconomic subjects and their interaction

Among macroeconomic subjects there can be distinguished:

- *Household sector* - it contains all private economies of the country whose activity is directed to private needs satisfaction. Households have tree types of economic activity: they suggest factors of production, consume a part of obtained revenue and save.
- *Business sector* is an aggregate of all firms that are registered inside the country. Business sector has such types of economic activity: it forwards demand on factors of production, suggests results of its activity and makes investments.
- *Public sector* includes all state institutions and establishments. The state produces public goods which come to customerse “free of charge” (security, achievement of fundamental science, state services, social and productive infrastructures).
- *Foreign sector* includes all economic subjects which are outside of a definite country and foreign state institutions. Foreign influence on domestic economy is effectuated through goods, services, capital and national currencies exchange.

4. Methods of macroeconomic analysis

Macroeconomics uses dialectically-materialistic methods such as:

✓ Analysis;
✓ Synthesis;
✓ Induction;
✓ Deduction;
✓ Abstraction etc.

A principal method of macroeconomic researches is economically-mathematical modulation.

Macromodels are mathematical equations in which real economic processes are expressed in abstract and simplified view.

To create a model means to find a function which connects endogenous and exogenous parameters of a macromodel.

Exogenous parameters are parameters that are outside of a macromodel (as a rule this is a technology of production and character of behaviour of economic subjects on each market).

Exogenous parameters are determined in result of a model resolving (for example: an amount of real national revenue, employment level, rate of real wage, real percentage rate and price level).

Functional links of endogenous parameters have such classification:

- *Behavior functions* express advantages that were formed in a society. For example, it can be a function of household consumption from revenue:

$$\mathbf{C = C(Y)}$$

- *Technical functions* characterize technical dependence.

For example, it can be a productive function:

$$\mathbf{Q = f(X_1, X_2,\ldots, X_n)}$$

- *Institutional functions* reflect institutionally established dependences between model parameters.

For example: the sum of tax payments (T) is a function from revenue (Y) and tax rate T(Y) that is determined by a corresponding institution:

$$\mathbf{T = f(T(Y), Y)}$$

- *Definitional functions* express dependencies that derive from the definition of economic events. For example: aggregate demand on the market of goods (Y) consists of aggregate demand of households (C), demand of investments of a business sector (I), government (G) and foreign (E) expenses:

$$\mathbf{Y = C+I+G+E}$$

There are two types of macroeconomic model:

- Static model;
- Dynamic model.

Static models fix an economic process at the beginning and the end of a definite period and don't reflect transition from one state to another.

Dynamic models reflect processes taking into account a time factor.

5. The Circular Flow of Income

Most important to understanding macroeconomics is the manner in which income is generated and transferred from one participant in the economy to another. Virtually all income earned by members of society comes from the sale of a good or service. The total dollar value of income earned by all members of the economy in a given time period is essentially equal to the total dollar value of all goods and services produced and sold in the economy during the same time period. A dollar's worth of output produced and sold becomes a dollar's worth of income earned by someone (usually the producer of the output) in the economy. One person's purchases of goods and services become another's income.

Income flows from households to businesses and to the government, from businesses to households and to the government, and from the government to households and to businesses. This **circular flow of income** from one sector to another and back again describes economic activity in our economy. Money changes hands over and over again, with sales becoming the source of income, and vice versa. Understanding the circular flow is crucial to understanding macroeconomics. The fundamental properties of the circular flow offer some explanations for income expansion and decline as well as for inflation and unemployment.

A Two-Sector Circular Flow Model

In a simple economy with no government, the sales revenues received in the business sector become the income of the members of the household sector, as Figure 1-1 depicts. Dividing the economy into these two sectors may seem arbitrary, but it helps to organize the study of economic activity. The **household sector** refers to just what the word "household" suggests, the conglomeration of all economic activities not directly related to the production and sale of goods and services. Everyone, from corporate magnates to beach bums, belongs to the household sector and spends at least part of the day engaged in such economic activities.

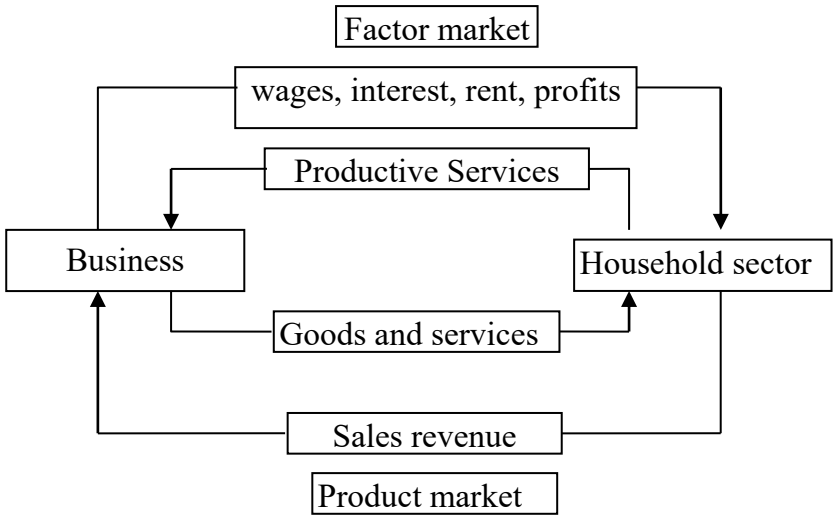


Figure 1-1. A two-sector circular flow model

The **business sector** refers to all economic activities associated with the production and sales of goods and services. Over half the population spends part of its day in the business sector helping to produce goods and services. Together, these two sectors make up the **private sector,** which stands in contrast to the government.

The Two-Way Flow Members of the household sector sell their productive services to the business sector in the factor market. These services are used to produce products that are sold by businesses in the product market either to other businesses or to the household sector. Products sold within the business sector are ultimately used to produce other products that are sold to the household sector. All of the sales revenue earned in the business sector from selling products to the household sector is used to purchase productive services from the household sector. Sales revenue in the business sector becomes the income of the household sector. With that income, members of the household sector have the ability to buy the goods and services they have helped produce in the business sector.

The income that flows from the business sector to the household sector comes in four forms: wages, rent, interest, and profits. These payments reward the three factors of production: land, labor, and capital. As discussed earlier, every product requires at least a little of each factor. (To review, land includes property and raw materials; labor refers to all productive human services; and capital refers to the machines, tools, and buildings that labor uses to turn land into products.) **Wages,** which include salaries, tips, and so forth, are the payments for labor. **Rents** are the payments for the use of land and its imbedded resources. **Interest** and **profits** are the rewards to those people in the household sector who provide financial capital (funds) to the business sector for the purchase of physical capital (machines, tools, and buildings). Interest payments go to those who lend money by buying bonds, and profits go in the form of dividends to those who purchase partial ownership in the form of stocks. What makes a capitalist economy unique is that all three factors of production are primarily owned by the household sector rather than by the state, and the household sector receives the rewards for supplying those factors to the business sector. The sum of wages, rents, interest, and profits is the **national income *(NI).***

The business sector uses the three factors of production that the household sector supplies in order to produce the economy's goods and services. This relationship between the business and household sectors may not be apparent at first glance, since businesses seem to use such materials as electricity, coal, and lumber to produce their products. But those materials, like all products, come from land through the efforts of labor and capital. The sum of the dollar value of all those goods and services is labeled **gross national product (GNP).** Except for some accounting adjustments (that we will consider in the next chapter), *gross national product theoretically equals national income.* The goods and services flowing in both directions, to and from the household, are equal in dollar terms. A dollar's worth of output always creates a dollar's worth of income headed for the household sector.

That this should be the case seems obvious. Amazingly, though, this truism often escapes the attention of economic analysts. Where, for instance, do those billions of dollars of Exxon profits go? Not into a black hole. They go to the household sector. Exxon stockholders (about 700,000 of them) receive dividends. Whoever the owners (stockholders) of Exxon are, all 700,000 of them go home at night – in other words, they are a part of the household sector.

Almost akin to a law of physics is the conservation of income in the circular flow: What is received as payments for goods and services in the business sector must flow through the household sector. After all, where else would the income flow? Even if the Exxon profits are retained and plowed back into Exxon, they will be used to purchase land, labor, and capital, all of which are owned by the household sector.

Here is the first example of how clear the study of macro can be if we remember to aggregate. For example, what happens to aggregate household income if Exxon and all other U.S. sellers of gasoline raise gasoline prices to $2 a gallon? Nothing at all. Household income may be redistributed, but the grand total national income, or *NI,* is unaffected. All of *NI* flows to the household sector. From the macro vantage point, it does not matter whether Exxon makes more income and leaves less for others, because Exxon is owned by the household sector as is the rest of the economy. The household sector is one big unhappy family. The same reasoning would prevail for a hike in apartment rents by every landlord in the country. One group of households gains, and another group loses. There is no net effect on *NI* going to the household sector. Remember the following principle:

Wages do not equal NI.
NI = wages + rent + interest + profits

Contrary to what many people believe, the household sector is not made up of just workers carrying lunch pails. Owners of land and capital are included (though most of them are also workers as well).

Since all of *NI* is earned by the household sector, it is possible for the household sector to purchase all of the output in the product market. If the households were to spend exactly all of their *NI,* the dollar value of household spending would equal the dollar value of the output, GNP. Household spending, called **consumption,** would equal GNP. Demand would equal supply in the product market.

Income, Output, and Prices Some distinctions in terminology are necessary to avoid confusion. National Income and Gross National Product measure the dollar value of output *(Q).* They are calculated by multiplying output times the general price level *(P).* When current prices are used in that calcualtion, the result is called **nominal** or **money *NI*** (or **money GNP).**

money NI (or money GNP) = output x current prices

Changes in money *NI* result from changes in prices and/or changes in output. A rise in money *NI* or money GNP does not necessarily result from a rise in output. **Inflation,** which is a rise in the general price level, alone can cause money *NI* to rise.

In order to focus on output, *NI* and GNP are often calculated by using constant prices. When the dollar value of output is expressed in terms of constant dollars, it is called **real *NI*** (or **real GNP).** Changes in real *NI* or real GNP occur *only when output changes.* We will discuss more specifically how real *NI* and real GNP are calculated from money *NI* and money GNP in the next chapter. For now, let it be clear that changes in output and changes in real *NI* or real GNP mean the same thing.

real NI or real GNP = output x constant prices
changes in real NI or real GNP = changes in output
Δ real NI or Δ real GNP = ΔQ

As will become progressively more apparent, keeping track of real income is usually more informative than keeping track of money income, although both are involved in macroeconomic study. To eliminate the confusion and inconsistencies that often plague media reports on this subject, we will use the following:

output = Q = real NI or real GNP
GNP = money gross national product
NI = money national income

GNP and *NI* change with both the price level and output. Real GNP or real *NI* change only with changes in output.

The word *real* in economics always means adjusted for the effects of price increases. Thus, in any economics discussion, real wages, real interest rates, real returns, and so forth signify constant dollars or constant purchasing power.

Saving and Investment Few households ever spend exactly what they earn. Some spend more; but most spend less than their income. The household sector typically saves part of its income. To **save** is to not consume, and **saving** is the portion of income that the household sector does not consume.

The business sector often borrows the household sector's savings in order to finance their purchases of capital. These purchases are called **investment.** In economics it is necessary to distinguish between *investment,* which is the purchase of capital by businesses, and *financial investment,* which is the purchase of financial assets such as stocks and bonds. Financial investment is simply a method of saving. The household sector saves its income by purchasing savings accounts, certificates of

deposit, stocks, bonds, and other financial assets. Even though we all colloquially refer to a purchase of stock as an "investment," a stock purchase, just like the purchase of a savings bond, is a form of saving. It just sounds more exciting to call such purchases investments. In economics the terms *investment* and *private investment* refer to business purchases of capital.

The word *investment* should make you think of machines, not stocks. The word *saving* should make you think of "not spending" on goods and services. Savings are the funds with which financial investments (purchases of financial assets) are made. Those funds are borrowed by the business sector in order to make investments, purchases of capital. As Figure 1-2 shows, it is the financial markets, the money and capital markets, that channel households' savings in the form of financial investments to businesses.

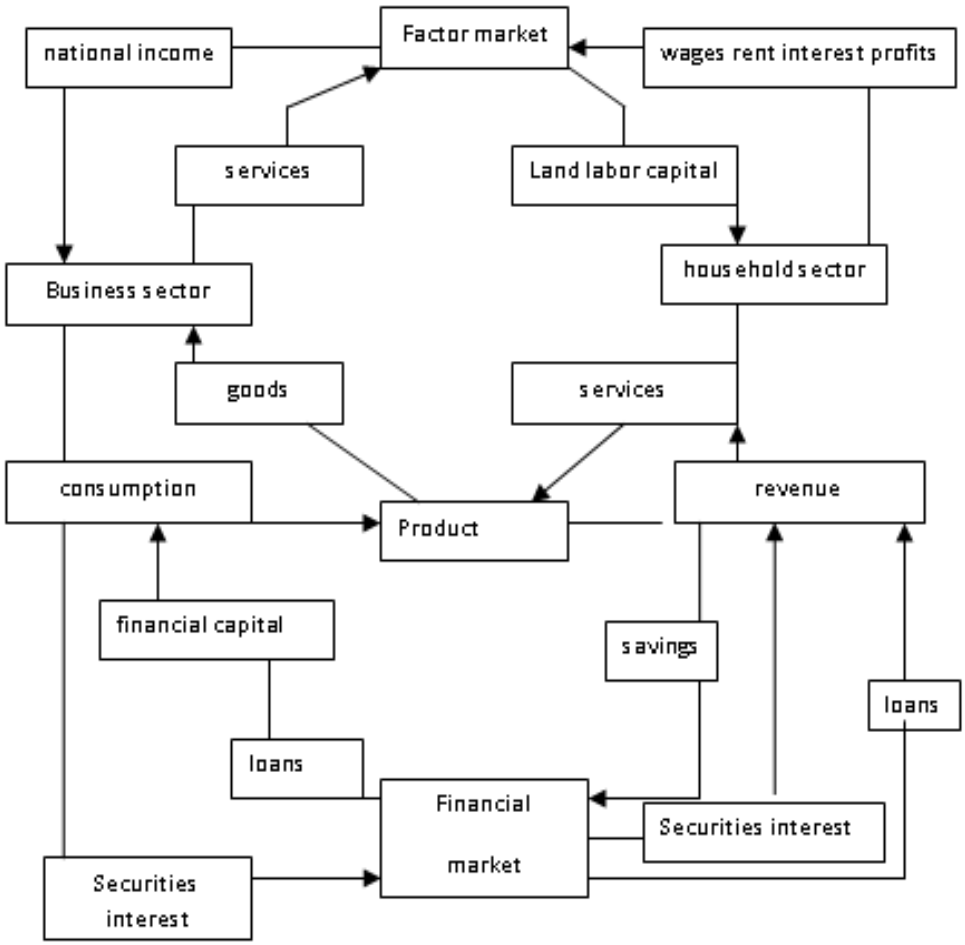


Figure 1-2 A two-sector circular flow model with financial intermediaries

The income savers of the household sector (sometimes called *surplus savers)* are the ultimate lenders in the financial markets, and businesses (and, as we will discuss later, the federal government) are the ultimate borrowers (sometimes called

deficit spenders). Often the household savers lend directly to the business spenders by purchasing stocks and bonds. Most of the time, a financial intermediary, such as a bank or savings and loan institutions, transfers the funds from the surplus savers to the deficit spenders. If the funds saved were to equal exactly the funds borrowed and invested, the total spending of the household and business sectors would equal output. All income paid out by the business sector to the household sector in wages, rent, interest, and profits would return to the business sector in the form of purchases of their output. The circular flow would be intact. As we will learn soon, however, the amount of saving does not always equal the amount of investment, and purchases, as a result, do not always equal output.

Figure 1-2 shows all three macro markets at the same time. Productive services are exchanged for *NI* in the *factor market.* The interaction of factor demand and factor supply determines the level of factor incomes and factor utilization. Goods and service are exchanged in the *product market,* where the interaction of aggregate product demand and aggregate supply determines the level of output, prices, and *NI.* And mixed in with these two markets is the *financial* (or *money) market,* where the demand for and supply of money or credit determine the level of interest rates. The Federal Reserve (or the Fed), our country's central bank, polices the financial markets, particularly the money market. The Fed's most important job in the money market is to control the money supply. That responsibility is called **monetary policy,** and we will be studying it a lot throughout this book.

Adding the Government to the Circular Flow Model

As Figure 1-3 shows, adding a third sector, the government, complicates the circular flow picture; but it does not change the fundamental relationships. The dollar value of the goods and services produced in the business and government sectors together is equal to the value of income flows paid to the household sector. The household sector still supplies all the factors of production and ultimately earns all of the *NI.* Some of the income is redirected so that certain individual households receive less income than they earned, while others receive more than they earned. Nevertheless, total *NI* still all flows to the household sector.

Payments flow into the federal government from the other two sectors through taxes on household income and business income and sales as well as purchases by the private sector of government services. The many government agencies pay out income through purchases of goods and services from the business sector, purchases of productive services from the household sector, and income transfers to the household sector. Federal government spending *(G)* comes in two forms, **government purchases *(GP)*** and **government transfers *(GT).*** *GP* refers to purchases of goods and services; *GT* refers to payments (primarily to the household sector) that are not in return for any good or service.

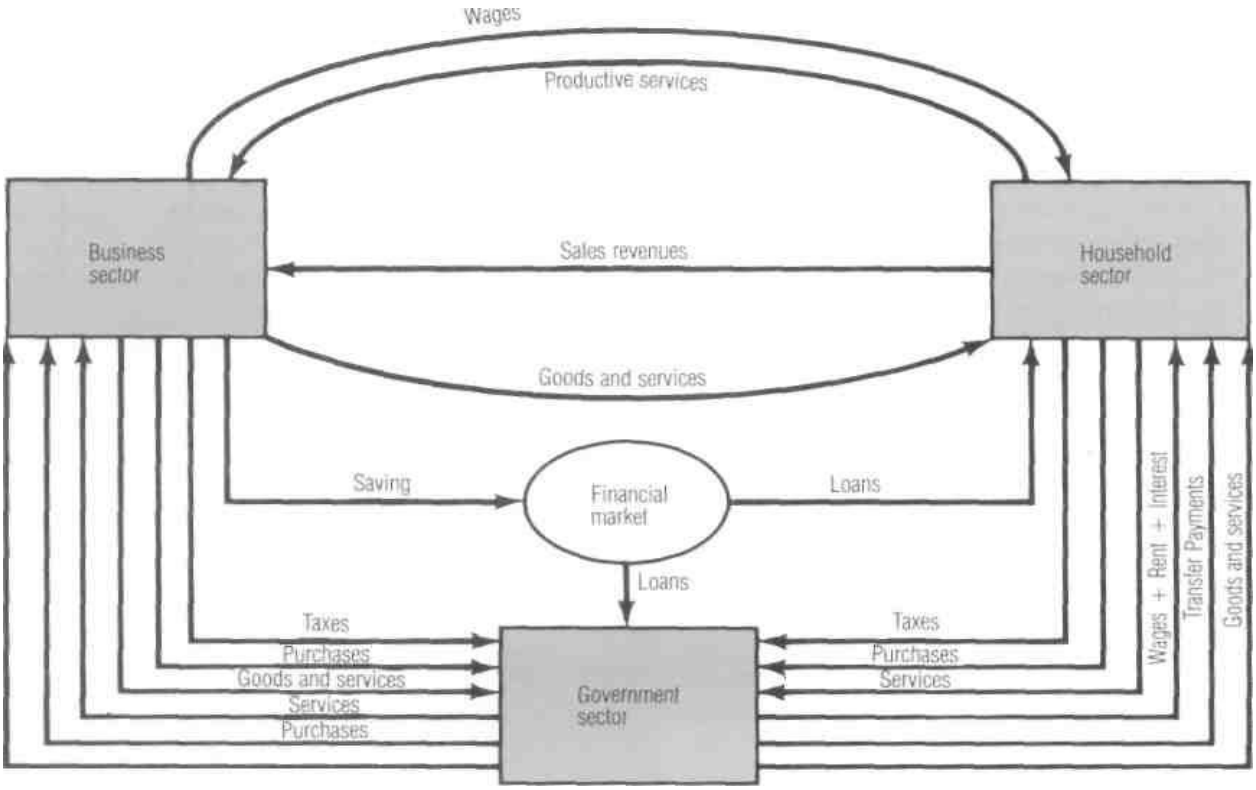


Figure 1-3 A three-sector circular flow model

As we will study in great detail in Chapter 8, the government sector spends the private sector's income. It obtains this income either by taxing it away from the private sector or by borrowing it. When the government spends beyond its tax income, it must borrow; and it borrows in the same financial markets used by the borrowers of the private sector. All else being equal, the government sector can spend more only if the private sector spends less. The government's taxing and spending policies are called **fiscal policy,** which we will discuss in later chapters.

Adding the Foreign Sector to the Circular Flow Model

We need to add one more sector, the foreign trade sector. Income enters and exits the economy's circular flow by way of trade with the rest of the world's economies. We will study these transactions in some detail in Chapter 14, but we can take a preliminary look here at how they affect the circular flow. Income exits the circular flow to purchase foreign products, that is, **imports.** But income also flows into the sector disrupts the closed circular flow of income in the domestic economy. Since income goes into and out of the circular flow as a result of foreign transactions, the foreign sector can have a significant impact on how supply and demand compare in the product, money, and factor markets.

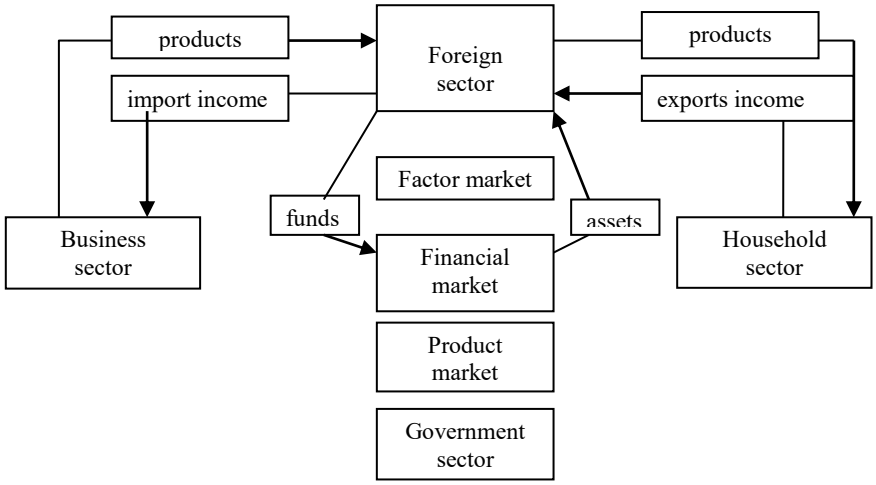


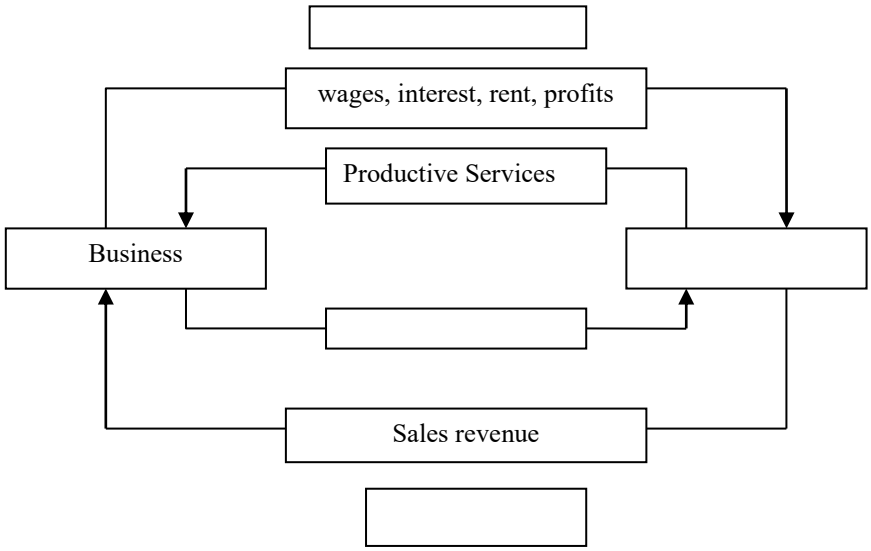
Figure 1-4 A complete four-sector circular flow model

Figure 1-4 shows that importing products causes income to leak out of the circular flow. The amount of product demand flowing to the business sector is reduced, and products may remain unsold. On the other hand, exporting products causes income and demand to be injected back into the circular flow. The net effect of these leakages and injections, called **net product exports,** can reduce or augment domestic demand and sales of products and factors. In addition, the net flows of financial assets into and out of the financial markets can have a big impact on the demand for and supply of credit.

The circular flow model is a very important concept, and we will refer back to it often. It is the first of many models that we will use to analyze the macro economy. To build and understand these models, however, certain tools are necessary. Before embarking on our tour of the macro economy, we must discuss the "tools of the trade."

Test

1. Macroeconomics is _____ because it sets more lofty sights.
2. These three macro markets are the product, _____, and factor markets.
3. The set let pass:



3. The sum of wages, rents, interest, and profits is the _____.

4. The sum of the dollar value of all those goods and services is labeled **gross _____.**

5. NI = wages + rent + interest + _____

6. Federal government spending *(G)* comes in two forms, **government purchases *(GP)*** and _____ ***(GT).*** *GP* refers to purchases of goods and services; *GT* refers to payments (primarily to the household sector) that are not in return for any good or service.

7. Income exits the circular flow to purchase foreign products, that is, _____.

8. The net effect of these leakages and injections, called **net product _____,** can reduce or augment domestic demand and sales of products and factors. In addition, the net flows of financial assets into and out of the financial markets can have a big impact on the demand for and supply of credit.

Chapter 2
Macroecomical indicators and methods of their measurement

In this chapter we will explore:
1. The main macroeconomical indicators.
2. The indicator of GNP in the system of national accounts.
3. Nominal and actual GNP. GNP deflator.
4. Net economical wealth.
5. Measuring the Price Level

1. The main macroeconomical indicators

- *National volume of manufacture*

This indicator is used to determine the volume of products and services produced in some period of time. According to the method which uses most countries of the world national manufactured production is determined in such an indicator as gross internal product (GIP).

GIP is determined as a whole value of all final products and services produced in the country per year.

- *Derive income GNP* which is totally out of current manufacture and is used for consumption, accumulation, export, and also for replacement of lost means of manufacture.

Derive income includes such production as:
- used for individual and social consumption
- intended for replacement of main production and non – production funds
- used to gain production and non – production funds
- intended to gain production and non – production stocks
- used for export.

Gross internal product includes intermediate products which are used for the manufacture of other products: raw material, materials, fuel and so on.

To avoid double account measuring GIP we need to sum added values on every stage of manufacture.

- *Added value* is a value which is created in process of manufacture on concrete enterprise and determines its real contribution in creation of value of concrete product.

Added value includes *wage, amortization and income*.

Added value is determined as a difference between the income from selling and value of financial costs on manufacture and products realization.

Adding the difference between the incomes from means of manufacture from abroad and factorial incomes, which foreign investors took within the country, to GIP we'll get GNP indicator.

- *General price level*

This indicator determines an average price level of some products group which is counted due to price index. Price level is monetary appraisal of good or aggregate of goods, which works as price scale.

Price index shows relative change of the average price level during some period. Price index is determined using such a formula:

Price index of the current year=Current year prices / Base year prices • 100%

Price index which is used to move off inflation influence on GIP indicator is called *GIP – deflator*.

Deflator is determined as an average weight price of all goods and services in GIP and weight of every good equals to some part in total GIP.

- *Interest rate*

*Interest rate level (**i**)* characterizes costs which macroeconomical subjects do using bill of debt counting on OPKU lending monetary unit per year. Interest rates are under the influence of the market mechanism; if monetary supply decreases then the interest rates increase and on the contrary.

There are *nominal* and *actual* interest rates:

RIR = NIP – IL

Where, **RIR** - real interest rate;
NIR – nominal interest rate;
IL – inflation level.

- *Unemployment rate*

This indicator reflects the ratio between the amounts of adult working population and amounts of unemployed people in concrete country.

Gross national product in the system of national accounts

The *system of national accounts* is the international standard of estimation of the main economical indicators of the country. It contains such macro economical indicators as: GNP, GIP.

2. The indicator of GNP in the system of national accounts

Gross National Product (GNP) is a measure of the value of all goods and services produced by a country's residents and businesses. It estimates the value of the final products and services manufactured by a country's residents, regardless of the production location.

GNP is calculated by adding personal consumption expenditures, government expenditures, private domestic investments, net exports, and all income earned by

residents in foreign countries, minus the income earned by foreign residents within the domestic economy. The net exports are calculated by subtracting the value of imports from the value of the country's exports.

Unlike Gross Domestic Product (GDP), which takes the value of goods and services based on the geographical location of production, Gross National Product estimates the value of goods and services based on the location of ownership. It is equal to the value of a country's GDP plus any income earned by the residents in foreign investments, minus the income earned inside the country by foreign residents. GNP excludes the value of any intermediary goods to eliminate the chances of double counting since these entries are included in the value of the final products and services.

How to Calculate the Gross National Product?

The official formula for calculating GNP is as follows:

$$\mathbf{Y = C + I + G + X + Z}$$

Where:

C – Consumption Expenditure
I – Investment
G – Government Expenditure
E – Net Exports (Value of imports minus value of exports)
Z – Net Income (Net income inflow from abroad minus net income outflow to foreign countries)

Alternatively, the Gross National Product can also be calculated as follows:

GNP = GDP + Net Income Inflow from Overseas – Net Income Outflow to Foreign Countries

Where:

GDP = Consumption + Investment + Government Expenditure + Exports – Imports

Gross National Product takes into account the manufacturing of tangible goods such as vehicles, agricultural products, machinery, etc., as well as the provision of services like healthcare, business consultancy, and education. GNP also includes taxes and depreciation. The cost of services used in producing goods is not computed independently since it is included in the cost of finished products.

For year to year comparisons, Gross National Product needs to be adjusted for inflation to produce real GNP. Also, for country to country comparisons, GNP is stated on a per capita basis. In computing GNP, there are complications on how to account for dual citizenship. If a producer or manufacturer holds citizenship in two countries, both countries will take into account his productive output, and this will result in double counting.

Importance of GNP

Policymakers rely on Gross National Product as one of the important economic indicators. GNP produces crucial information on manufacturing, savings, investments, employment, production outputs of major companies, and other economic variables. Policymakers use this information in preparing policy papers that legislators use to make laws. Economists rely on the GNP data to solve national problems such as inflation and poverty.

When calculating the amount of income earned by a country's residents regardless of their location, GNP becomes a more reliable indicator than GDP. In the globalized economy, individuals enjoy many opportunities to earn an income, both from domestic and foreign sources. When measuring such broad data, GNP provides information that other productivity measures do not include. If residents of a country were limited to domestic sources of income, GNP would be equal to GDP, and it would be less valuable to the government and policymakers.

The information provided by GNP also helps in analyzing the balance of payments. The balance of payments is determined by the difference between a country's exports to foreign countries and the value of the products and services imported. A balance of payments deficit means that the country imports more goods and services than the value of exports. A balance of payments surplus means that the value of the country's exports is higher than the imports.

GNP vs. GDP

Both the ***Gross National Product (GNP)*** and ***Gross Domestic Product (GDP)*** measure the market value of products and services produced in the economy. The terms differ in what constitutes an economy since GDP measures the domestic levels of production while GNP measures the level of the output of a country's residents regardless of their location. The difference comes from the fact that there may be many domestic companies that produce goods for the rest of the world, and there may be foreign-owned companies that produce products within the country. If the income earned by domestic firms in overseas countries exceeds the income earned by foreign firms within the country, GNP is higher than the GDP. For example, the GNP of the United States is $250 billion higher than its GDP due to the high number of production activities by U.S. citizens in overseas countries.

Most countries around the world use GDP to measure economic activity in their country. The U.S. used Gross National Product as the primary measure of economic activity until 1991 when it adopted GDP. When making the changes, the Bureau of Economic Analysis (BEA) observed that GDP was a more convenient economic indicator of the total economic activity in the United States.

The GNP is a useful economic indicator, especially when measuring a country's income from international trade. Both economic indicators should be considered when valuing a country's economic net worth to get an accurate position of the economy.

Gross National Income (GNI)

Instead of Gross National Product, Gross National Income (GNI) is used by large institutions such as the European Union (EU), The World Bank, and the Human Development Index (HDI). It is defined as GDP plus net income from abroad, plus net taxes and subsidies receivable from abroad. GNI measures the income received by a country's residents from domestic and foreign trade. Although both GNI and GNP are similar in purpose, GNI is considered a better measure of income than production.

Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is the monetary value, in local currency, of all final economic goods and services produced in a country during a specific period of time. It is the broadest financial measurement of a nation's total economic activity. The total goods and services bought by consumers encompass all private expenditures, government spending, investments, and net exports. Below are three different approaches to the GDP formula.

There are two primary methods or formulas by which GDP can be determined:

GDP calculation by the expenditure

$$\mathbf{GDP = C + I_g + G + NE}$$

Where, **C** – consumers' expenditure;
$\mathbf{I_g}$ – gross private investments;
G - public expenditure;
NE – net export.

*Consumption expenditure (**C**)* consumption or all private consumer spending within a country's economy, including, durable goods (items with a lifespan greater than three years), non-durable goods (food & clothing), and services.

*Gross private investments (**I**)* sum of a country's investments spent on capital equipment, inventories, and housing. Gross private investments (**I**) consist of:

- investments on capital replacement, which was used in the process of manufacture during the year (amortization);
- net investments (net gain of the main capital volumes).

*Total government expenditures (**G**),* including salaries of government employees, road construction/repair, public schools, and military expenditure.

State transfer payments are not included because they don't reflect current manufacture growth.

*Net export (**NE**)* or a country's total exports less total imports.

$$\mathbf{NE = E - Z}$$

Where, **E** – export;

Z – import.

NE can be negative data.

Government transfer payments are payments to the individuals who don't directly cause their participation in social manufacture.

They include:

- unemployment help;
- pensions to veterans;
- help to old and ill people.

They are intended to satisfy a concrete kind of needs. As transfers are not intended for purchasing current goods and services by the state, they are not taken into account calculating GNP.

Calculation of GDP by the incomes:

GDP= W+R+i+p+A+Tn

Where, **W** – wage;
R – rent;
i - interest;
p – profit;
A – amortization;
Tn – indirect taxes.

Wage is money award given for the labor to workers and employees, which include additional payments for social maintenance, social insurance, payments from individual's pension funds.

Rent determines incomes from rent, which receive domestic facilities for the grounds, buildings, accommodations given in rent.

Interest in this case is an income from the money capital, saved by the domestic facilities.

Profit which the sole facilities, communities (non-corporate profit) and corporations (dividends+undivided profit) owners receive.

Amortization is an equivalent of the size of the main capital depreciation during the year.

Indirect taxes are established in goods and services prices and their size for the separate payer does not directly depend on his profits (universal excises, customs duty, tax to added cost).

Gross internal product

GIP includes production and services, which are produced by the residents of the country during the year.

The residents are:

- the physical persons of the country with a constant residence in this country (including those who temporarily is out of the country);

- the legal persons of the country with a site in this country;
- the enterprises and organizations - not the legal persons, which were created according to the legislation of the country, but are out of it.
- diplomatic and other representations out of the country;
- foreign branches and representations of the country residents.

$$\mathbf{GIP = GNP - NE}$$

Where, **GIP** – gross internal product;
GNP – gross national product;
NE – net export.

Net national product

Net national product represents the Gross National Product, from which was the cost of manufacture means taken out; this cost was worn out during the process of manufacture (amortizations deductions).

$$\mathbf{NNP = GNP - A}$$

Where, **NNP** –net national product;
GNP – gross national product;
A – amortization.

National Income

National income is the income, which is determined trough taking out indirect taxes from the value of net national product.

$$\mathbf{NI = NNP - Tn}$$

Where, **NNP** – net national product;
Tn – indirect taxes.

National Income is the sum of income factors from the labor, ground and capital per year.

$$\mathbf{NI = W+R+i+p}$$

Where, **W** – wage;
R – rent;
i - interest;
p – profit;

Personal Income

Personal Income is the income, which was taken by the individuals. It is divided to consumption, saving and taxes payment.

PI = NI – social insurance payments – income taxes of the corporations – undivided profit + transfer payments.

Derive income

Derive income is a part of personal income, which is left after paying the individual taxes. Ended consumption profit id divided to consumption and savings.

DI = PI – Tind

Where, **PI** – personal income;
Tind– individual taxes.

Individual taxes include:
1. Personal income taxes.
2. Personal property taxes.
3. Inheritance taxes.

System of national accounts is the international standard of estimation of the main economic indicators of the country.

In the table one can see the conditional model of indicators interaction in the system of national accounts.

Incomes: measurement of GNP by the sum of costs (method of production flow)		**Distribution: measurement of GNP by the sum of incomes (method of costs flow)**	
Personal consumption costs	3548	Amortization	555
Gross personal internal investments	432	Indirect business taxes	841
State's purchasing of goods and services	1060	Wage	3196
Net export	102	Rent payments	25
GNP	**5347**	Interests	428
Amortization deduction	-555	The incomes of incorporate business	360
NNP	**4792**	Income taxes of the corporations	159
Indirect business taxes	-432	Dividends	105
National income	**4360**	Unshared income of the corporations	87
Payments on social insurance	-489	**GNP**	**5347**
Income taxes of the corporations	-159		
Unshared income of the corporations	-87		
Transfer payments	845		
Personal income	**4470**		
Individual taxes	-649		
Derive income	**3821**		

4. Nominal and real GDP

GPD can be measured in several different ways. The most common methods include:

- **Nominal GDP** – the total value of all goods and services produced at current market prices. This includes all the changes in market prices during the current year due to inflation or deflation.
- **Real GDP** – the sum of all goods and services produced at constant prices. The prices used in determining the Gross Domestic Product are based on a certain base year or the previous year. This provides a more accurate account of economic growth, as it is already an inflation-adjusted measurement, meaning the effects of inflation are taken out.
- **Actual GDP** – real-time measurement of all outputs at any interval or any given time. It demonstrates the existing state of business of the economy.
- **Potential GDP** – ideal economic condition with 100% employment across all sectors, steady currency, and stable product prices.

We have discussed *real GDP* briefly in the beginning of this chapter, and then nominal GDP in some detail. Now we need to look carefully at both concepts and the relationship between them, which is the GDP deflator.

Nominal GDP measures output and incomes based on current market prices for goods and services and factors of production. As a result, changes in nominal GDP from one period to the next might be the result of changes in prices of final outputs and factor inputs, or the result of changes in the quantities of final outputs and factor inputs, or some combination of the two.

Since it is physical quantities of goods and services that yield satisfaction or utility, it can be misleading to judge the economy's performance by looking at nominal GDP. For that purpose we need real GDP, as we discussed earlier in this chapter. Real GDP, or GDP in constant prices, measures the value of goods and services produced in any given year using the prices of a base year. In this way, real GDP adjusts changes in GDP for changes in prices by measuring GDP in different years in constant prices.

To illustrate this important point, Table 4.1 shows a simple economy that produces both consumer goods, blue jeans, and capital goods, solar panels. In this economy nominal GDP rises from $300,000 to $570,000 between 2016 and 2020, a 90 percent increase measured in current prices as a result of changes in both quantities and prices. If we take 2016 as the base year, we can measure real GDP in 2020 by valuing output quantities in 2020 using 2016 prices. This gives real GDP in 2020 of $525,000 in prices of the base year. In the example in the table, quantities of both products rise over the period but the price of blue jeans rises while the price of solar panels falls. As a result the rise of about 75 percent in real GDP gives a truer picture of the extra quantity of goods available in the economy in 2020 compared with 2016. It eliminates the change in GDP that was the result of the changes in prices by 8.6 percent between 2016 and 2020.

		2014	2018 %	Change
Quantity	blue jeans	4,000	5,000	25
	solar panels	2,000	4,000	100
Price in $	blue jeans	25	50	100
	solar panels	100	80	-20
Current value	blue jeans	100,000	250,000	150
	solar panels	200,000	320,000	60
Nominal GDP		300,000	570,000	90
Value in 2000 $	blue jeans	100,000	125,000	25
	solar panels	200,000	400,000	100
Real GDP		300,000	525,000	75
GDP deflator		100	108.6	8.6

Table 4.1 Nominal and real GDP

The GDP deflator

The Ukrainian economy is obviously more complex than this economy. We have seen that GDP includes expenditures by households, governments, businesses, and residents of other countries who supply us with imports and buy our exports. To convert nominal GDP to real GDP we need to use an index that includes what is happening to the prices of all these different goods and services.

This index is called the *GDP deflator.*

GDP deflator: *index of current final output prices relative to base year prices.*

If we have data for both nominal and real GDP, we can calculate the GDP deflator as the ratio of nominal GDP to real GDP expressed as an index with a value of 100 in the base year.

$$GDP\ deflator = Nominal\ GDP\ Real\ GDP \times 100$$

The GDP deflator differs from the consumer price index (CPI) illustrated and used to measure inflation in consumer prices and the cost of living. First, the CPI is based on a "representative basket" of goods and services that consumers buy, while the GDP deflator is comprehensive and covers all the goods and services included in national accounts. Second, the CPI changes over time with changes in the prices of the basket of consumer goods and services.

The GDP deflator, by contrast, is built on the base year prices. It changes over time as the current prices change relative to base year prices. In other words the GDP deflator is used to "deflate" the dollar value of current 2015 output to what it would be in value would be in 2000 prices, while the CPI measures the increase in the cost of the "basket" of consumer goods and services.

But why does the GDP deflator change over time? The accounting data on nominal and real GDP do not provide an explanation. From our earlier discussion of the national income accounting framework, we can see that costs of production and net indirect taxes are include in the general level of market prices measured by the GDP deflator. Nominal GDP measured by the income approach is reported It is the sum of incomes paid to factor inputs to production, plus depreciation allowances and

net indirect taxes. These components of nominal GDP are the costs of production, gross profits, and taxes that are built into the market prices of the goods and services.

We can write:

Nominal GDP=employment income+profit, business, and investment income+capital consumption allowance+net indirect taxes

or

$$Nominal\ GDP = W + BI + CCA + T_{IN}$$

Alternatively, using the expenditure approach as illustrated, using Y to denote real GDP and P for the weight average price level we have:

$$Nominal\ GDP = P \times Y = P \times (C + I + G + X - IM)$$

Our national accounting framework and procedures tell us that nominal GDP will be the same whether measured by the income approach or the expenditure approach. This means we can define the general price level as:

$$P = W/Y + (BI+CCA)/Y + T_{IN}/Y$$

The general price level in the economy, in accounting terms is equal to the sum of:

1. employee compensation per unit of output,W/Y;
2. gross business income per unit of output, (BI+CCA)/Y; and
3. net indirect tax per unit of output TIN/Y.

Changes in the sum of these three components of the price level must change both price and nominal GDP, whether we measure nominal GDP by the income or the expenditure approach. The GDP deflator is an index of this price level in any particular year relative to a chosen base year. However, the accounting framework does not explain the causes of change in the price level. That requires explanations of changes in unit labour costs, of producer output and pricing decisions and information on the net indirect tax rate. Those explanations are parts of an economic model of the supply side of the economy. Now consider the empirical importance of the distinction between real and nominal GDP. Table 4.2 gives Canadian data over the period 2001 to 2013. Nominal GDP rose from 1,134.8 billion in 2001 to $1879.5 billion in 2013. Without knowing what happened to prices of goods and services in general, we cannot judge what happened to the quantity of output over that period. To answer this question we use the GDP deflator to convert nominal GDP to real GDP in the prices of the base year 2007 as follows:

$$\text{Real GDP}_{\text{yeart}} = \text{GDP}_t / \text{GDP deflator} \times 100$$

	2001	2005	2009	2013
Nominal GDP (bill $)	1,134.8	1,410.7	1,567.0	1,879.5
GDP deflator (2007=100)	84.6	94.3	101.6	110.9
Real GDP (bill 2007 $)	1,341.5	1,496.0	1,542.3	1,694.8

Table 4.2: Canadian nominal and real GDP 2001-2013
Source: Statistics Canada CANSIM Tables 380-0064 and 380-0066 and author's calculations.

For example, in 2013, nominal GDP was $1,879.5 billion and the GDP deflator (2007=100) was 110.9. Real GDP measured in constant 2007 dollars was then:

$$\text{Real GDP}_{2013} = 1879.5/110.9 \times 100 = 1694.8 \text{ in 2007 dollars}$$

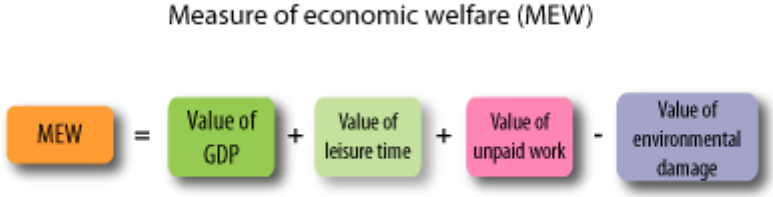
When converted to constant dollars, the change in real GDP is much smaller than the change in nominal GDP. Over the 2001-2013 period, real GDP increased by 26.3 percent compared to a 65.6 percent increase in nominal GDP. On average, prices in 2013 were 31.1 percent higher than in 2001. Clearly, it is important to distinguish between nominal and real GDP.

5. Measure of Economic Welfare (MEW)

During the late 1960s, many economists began to question the over-reliance of governments and agencies on narrow, exclusively GDP-based, measures of economic welfare. It was at this time that the adverse environmental effects of uncontrolled economic growth began to be considered, prompting the search for a wider measure of welfare, not exclusively based on raw GDP figures.

Nordhaus and Tobin

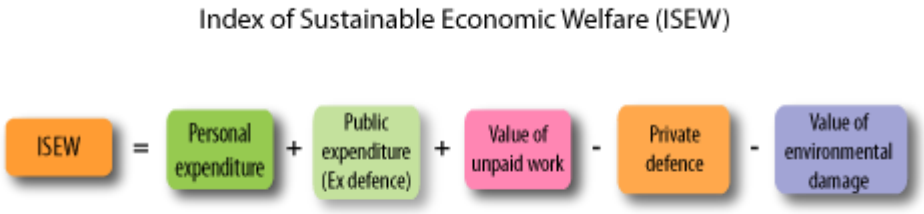
In 1972, Yale economists *William Nordhaus and James Tobin* their *Measure of Economic Welfare (MEW)** as an alternative to crude GDP. MEW took national output as a starting point, but adjusted it to include an assessment of the value of leisure time and the amount of unpaid work in an economy, hence increasing the welfare value of GDP. They also included the value of the environment damage caused by industrial production and consumption, which reduced the welfare value of GDP. MEW can be seen as the forerunner of later attempts to create a sophisticated index of sustainable development.



*NORDHAUS, WD AND TOBIN, J (1972) *IS GROWTH OBSOLETE?* ECONOMIC GROWTH, NATIONAL BUREAU OF ECONOMIC RESEARCH, NO 96, NEW YORK.

The Index of Sustainable Economic Welfare

The *Index of Sustainable Economic Welfare (ISEW)*, develops MEW by adjusting GDP further by taking into account a wider range of harmful effects of economic growth, and by excluding the value of public expenditure on defence.



6. **Measuring the Price Level**

No gauge of economic activity or conditions attracts more attention than the **inflation rate,** the rate of increase of *P,* the general price level. Every month we hear reports on the most recent change in the consumer price index and the producer price index. Changes in these indexes are used to estimate the present inflation rate in annual terms. Those estimates are in turn monitored by labor unions, social security recipients, money lenders and borrowers, business people, consumers, investors . . . just about everybody. How rapidly the cost of living and the cost of producing are rising or falling is critical to *individual* households' standards of living and *individual* businesses' profitability. One cannot be an intelligent participator in the economy without understanding what price indexes are and what they measure and do not measure. And to be a successful student of the macro economy, one must know how price indexes are calculated and how to read them.

Calculating a Price Index

Indexes are numerical yardsticks that keep track of the level of something compared to its level in a previous time period. It is possible to index anything that is in numerical terms. One could calculate a height index for growing children or a weight index for growing adults. Jerry Lewis could calculate an index of yearly contributions to fight muscular dystrophy, or the Pittsburgh Pirates could measure their changes in annual gate receipts on an index. Index numbers allow for easier year-to-year comparisons and determinations of percentage rates of change. Price indexes are simply a subset of economic indexes, which also include the index of economic indicators, the index of industrial production, and the Dow Jones thirty industrials average, among others. All such indexes have certain characteristics in common.

Index Numbers Regardless of its form, a price index always compares prices in one or more years (current years) with prices in a single, usually previous year called the **base year.** The most fundamental idea of a price index is that prices in the

base year are 100 percent, and prices in all other years are compared in terms of that 100 percent standard. If prices double from the base year to some current year, prices in the current year are 200 percent of the base year. Since all indexes are expressed in terms of the base year's value equaling 100 percent, the percentages are dropped off to form **index numbers,** which show relative numerical levels based upon the value of 100 percent. Thus, if prices in Year 2 are twice as high as in Year 1 (the base year), a price index for those two years would read:

Year l 100
Year 2 200

GNP = consumption
+ gross investment
+ government purchases
+ net product exports
Net national product = GNP - depreciation
NNP - indirect business taxes = national income
NI = wages and salaries
+ proprietors' income
+ rent
+ profits
+ interest

Personal income = *NI* – social security tax
– corporate profits tax
– retained earnings
+ government transfer payments
Disposable income = personal income - income taxes
DI = saving + consumption = *NI - NT*

Or, if you prefer that Year 2 be the base year, the price index would read:

Year 1 50
Year 2 100

In both cases, the index number in Year 2 is twice as large as the number for Year 1, meaning that prices were twice as high in Year 2 as in Year 1; or, put another way, that prices were half as high in Year 1 as Year 2. Either way, prices have doubled – that is, they have risen 100 percent.

The simplest formula for calculating a price index is:

(prices in current year prices in base year / prices in base year) x 100 = index number for current year

Two Kinds of Indexes. If we had only one price to monitor, or if all prices in the economy rose and fell at the same rate. But such is not the case. To be of any use in an aggregate sense, a price index must keep track of many prices on a wide variety

of goods and services. Individual prices rise and fall at widely varying rates. Even during inflationary times, some prices are falling. Anyone who is calculating a price index is faced with the decision of which prices to include and whether all price changes should be treated alike.

For example, suppose that in the next year bubble gum prices double from 20 to 40, while automobile prices rise, on the average, by 5 percent. How should a calculator of a price index treat these two disparate price changes? One option is to treat them equally, but that would yield a totally inaccurate, even silly measure of the cost of living. Unless bubble gum purchases take up as great a portion of total spending as do automobile purchases, a price index that treats these two price increases equally exaggerates the general inflationary bubble to a ridiculous extreme.

Every price index incorporates some system of weighting price changes in accordance with their relative importance. The first step in that weighting process is the choice of which goods or services to include in the so-called *basket of goods* covered by the index. Every price index has a different basket of goods and, therefore, provides a different picture of the processes of inflation or deflation. For example, when mink coat prices change, you see no change in the consumer price index, because that price index does not include mink coats in its basket of goods.

Once it is decided which goods should be included in the basket of goods for a price index, it is necessary to weight each of those goods by its relative importance. The standard method of weighting a price change is by what fraction it represents of the total amount of money spent on the entire basket of goods. That is, if 25 percent of the value of the basket of goods is spent on housing, changes in housing prices are multiplied by .25. Even though bubble gum prices may double, their impact on a price index will likely be small, because such purchases would likely take up a small percentage of the total money spent on the entire basket of goods – unless one is calculating a candy price index.

When determining these fractional weights, one must decide whether to calculate them from the base year or the current year. If the weights are determined from the quantities purchased during the base year, the price index is called a **Laspeyres index.** If they are determined from the current year, the index is called a **Paasche index.** Both indexes are named after their developers back in the nineteenth century. The simplest formulas for the two indexes are as follows (in which B = base, C = current, n = number of years):

Laspeyres:

$$\frac{P_C Q_B + P_C Q_B + \ldots + P_C Q_B}{P_B Q_B \; PBQB + \ldots + P_B Q_B} \quad \text{or} \quad \frac{\text{current prices and base quantities}}{\text{base prices and quantities}}$$

Paasche:

$$\frac{PcQc + PcQc + \ldots \mathbf{PcQc}}{P_B Q_C + P_B Q_C + \ldots + P_B Q_C} \quad \text{or} \quad \frac{\text{current prices and quantities}}{\text{base prices and current quantities}}$$

The Laspeyres index takes a basket of goods as it was purchased in the base year and then tracks the cost of that basket over time. The Paasche index takes a basket of goods as it is purchased in the current year and attaches base year prices to that basket.

The Laspeyres and Paasche methods are equally accurate, but the Laspeyres method is used more often since it is easier to calculate.

Some Popular Price Indexes

There are three price indexes over which economists, government officials, and the general public keep a watchful eye: the consumer price index (CPI), the producer price index (PPI), and the GNP implicit price deflator (IPD). All three are calculated monthly, and the figures for the first two are widely reported by the media as indicators of the inflation rate.

Consumer Price Index (CPI) The most widely known price index, the CPI, is calculated by the Bureau of Labor Statistics of the Department of Labor. In response to complaints from labor that their cost of living was rising more rapidly than was suspected. Since then the index has also been called the *cost-of-living index.*

The CPI has traditionally monitored a particular, limited basket of goods purchased by a typical urban wage earner and clerical worker. This basket of goods covers a broad range of goods and services, but it does not come close to including all products covered by GNP. Nevertheless, its cost is measured month after month and compared to the cost of the same basket in the base year. Since the basket of goods comes from the base year, the CPI is an example of a Laspeyres price index.

Another reason why the CPI exaggerates the true rise in the cost of living is that, due to a shortcoming in all Laspeyres indexes, the CPI does not allow for month-to-month or even year-to-year changes in the basket of goods. In actuality, the basket of goods purchased by consumers varies in response to changes in relative prices. Consumers substitute products that rise relatively slowly in price for those that rise relatively fast. By locking in the basket of goods to be measured, the bureau ensures that its data will be made more obsolete every day.

Even though the people at the Bureau of Labor Statistics would prefer that the CPI not be looked upon as a cost-of-living index, it is the measure of inflation that is most often cited by labor as a basis for their need for higher wages "to keep up with the cost of living." Many union contracts include an *escalator clause* that calls for an automatic upward adjustment of wages at the same rate as the inflation rate as measured by the change in the CPI. In addition, Congress regularly upgrades social security, veterans', and food stamp benefits according to the CPI in an effort to maintain the purchasing power of those benefits.

Thus, regardless of the Department of Labor's warnings to the contrary, the CPI is used as the primary indicator of changes in the cost of living. It is the price index that is most widely quoted. Since most people are not typical, however, and do not purchase the basket of goods identified by the Bureau of Labor Statistics, the CPI is an inaccurate (to some unknown degree) measure of the change in most people's

cost of living. Plus, since the CPI covers only a limited number of consumer goods, it is far from a true measure of the economy's inflation rate.

Producer Price Index (PPI) The Bureau of Labor Statistics' work does not end with the CPI; they also calculate the PPI. The PPI measures exactly what its title implies, the prices paid by producers in the intermediate good market. The basket of goods covered by the PPI includes almost 3,000 products priced as they would be for large lot orders. Although the PPI was once called the *wholesale price index,* it does not measure wholesale prices, which is why the bureau officially changed the name of the index not long ago. Since the PPI monitors the cost of a basket of products determined in the base year, it, like the CPI, is an example of a Laspeyres index.

The monthly figures on the PPI are issued early each month (for the previous month) and are reported almost as widely as those of the CPI. Since most retail price changes come about as a result of changes in production costs, it is correctly presumed that changes in the trend of the PPI portend future changes in the trend of the CPI. The two price indexes follow very similar courses. Producer prices tend to vary, however, much more than retail prices. For example, a restaurant does not change the price of its steak dinner every time beef prices change in either direction. As result, the PPI tends to be more volatile than the CPI. Both indexes zig and z; along the same route; the PPI simply has bigger zigs and zags.

KEY CONCEPTS

Macroeconomics studies the whole national economy as a system. It examines expenditure decisions by households, businesses, and governments, and the total flows of goods and services produced and incomes earned.

Real Gross Domestic Product (GDP), prices and inflation rates, and employment and unemployment rates are indicators of macroeconomic activity and performance.

Fluctuations in the growth rate of real GDP, in inflation rates, and in unemployment rates are important aspects of recent economic performance in Ukraine.

The expenditures by households, production of goods and services by business, and the incomes that result are illustrated by the **circular flow** of real resources and money payments.

The **National Accounts** provide a framework for the measurement of the output of the economy and the incomes earned in the economy.

Nominal GDP measures the output of final goods and services at market prices in the economy, and the money incomes earned by the factors of production.

Real GDP measures the output of final goods and services produced, and incomes earned at constant prices.

The **GDP deflator** is a measure of the price level for all final goods and services in the economy.

Real GDP and **per capita real GDP** are crude measures of national and individual welfare.

They ignore non-market activities, the composition of output, and the distribution of income among industries and households.

Chapter 3
Aggregate demand and aggregate supply

In this chapter we will explore:

1. The structure of aggregate demand (AD). The price and nonprice factors which define aggregate demand. The curve AD.
2. The multiplier.
3. The structure of aggregate supply. The price and nonprice factors which define aggregate supply. The curve AS.
4. Aggregate supply and demand equilibrium.
5. The Neoclassical Interpretation.
6. The Keynesian Interpretation
7. A Modern Synthesis

1. The structure of aggregate demand (AD). The price and nonprice factors which define aggregate demand. The curve AD.

National quantity of production and level of prices are determined by interaction of aggregate demand and aggregate supply.

Aggregate demand is a based specific form (a display social requires in conditions of functioning of commodity and monetary relationships.

Aggregate demand is a quantity of production which may be bought by macroeconomic subjects in the presence of each level of prices (P).

AD is the planned expenditures of all macroeconomic subjects.

Aggregate demand may be determined by the formula of accounting of GNI (Gross national income) by the method of costs:

$$\mathbf{GNI}_{\text{by the costs}} = \mathbf{(AD) = C + I + G + NE}$$

Where, C – consumption demand: a demand of payment abilities of consumption goods;

I – investment demand: a demand of enterprises on the means of production for:

- renovation of worn-out capital (amortization);
- increasing of real capital;

G – a state demand on goods and services:

1) for production of public goods;
2) state investments.

NE – foreign demands.

Consumption demand depends of:

1. Incomes from participation of production.
2. Taxes and transfer payments.
3. Quantity of property.
4. Income from property.
5. Average and marginal propensity.

6. The level of differentiation of population by incomes.

7. Number of population.

Average propensity of consumption (c) is a part of consumption (C) into income (Y):

$$\mathbf{c = C/Y}$$

Marginal propensity of consumption (c') is a part of increase of consumption (ΔC) in additional unit of income (ΔY):

$$\mathbf{c' = \Delta C/\Delta Y}$$

Consumption function has a such view:

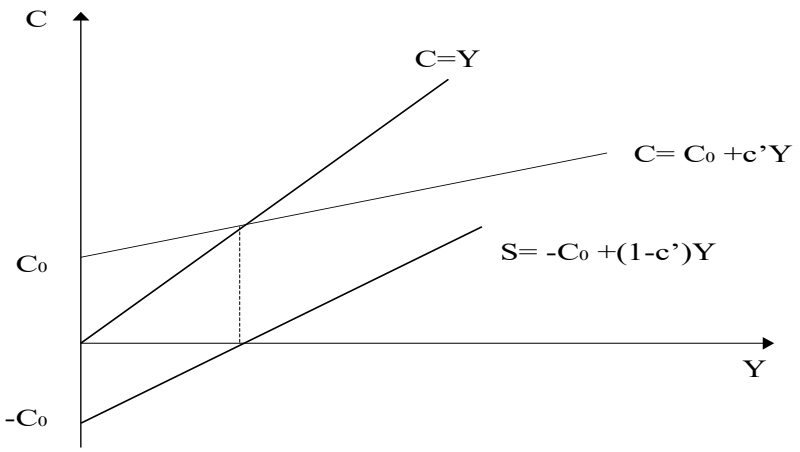
$$\mathbf{C = C_0 + c' \cdot Y}$$

Where, C_0 – autonomous consumption which does not depends of present income.

Saving (S) is a part of income which is not consumed. Each saving function correspond to each consumption function.

$$\mathbf{S = -C_0 + (1-c') \cdot Y}$$

So **1-c' = s'**- marginal propensity of saving



Graph 3.1 The consumption and saving functions

Investment demand.

Investments are the economic resources that are directed on increasing of real capital of society, so on enlargement and modernization of production potential.

Investment demand depends of:

1. Quantity of production.
2. Expenditures on capital.

3. Conjuncture of future.

Investment demand (I) is more exchangeable part of aggregate demand (AD).

Depending of factors which define the quantity of demand, consists of:

1. Investments which are accomplished in the presence steadfast increasing of demand on goods and services in result of increasing of national income stimulated. These investments are the function of increase of national income. Coefficient of increasing capital capacity is called accelerator (b).

Accelerator (b) is a coefficient which shows how many units of marginal fixed capital (k_0) are needed for production of marginal units of products (ΔY):

$$\mathbf{b = \Delta Y/\Delta K_0}$$

Where, ΔK_0 – increasing of fixed capital influenced by stimulated quantities.

2. Autonomous is investments when they are accomplished in the presence of fixed national income with unchangeable aggregate demand on goods. Autonomous investments accomplish for new techniques influencing the increasing of quality of production, become the condition of increasing of national income.

2. The multiplier.

The Keynesian Multiplier is an economic theory that asserts that an increase in private consumption expenditure, investment expenditure, or net government spending (gross government spending – government tax revenue) raises the total ***Gross Domestic Product (GDP)*** by more than the amount of the increase. Therefore, if private consumption expenditure increases by 10 units, the total GDP will increase by more than 10 units.

Keynesian Economic Theory

In 1936, economist ***John Maynard Keynes*** published a text that would change the course of economic thought. Titled "The General Theory of Employment, Interest, and Money," or simply as "The General Theory," it is considered one of the classical works in economics. The book attempted to explain short-term economic fluctuations in general, especially the fluctuations observed during the Great Depression in the early 1930s.

The main idea put forth by Keynes in The General Theory was that recessions and depressions could occur because of inadequate demand in the market for goods and services.

The General Theory was intended not just for economists but also for policymakers across the world. In response to widespread unemployment and low levels of economic activity across the world, Keynes called for an increase in government spending in order to boost demand for goods and services in the market. The thinking went against the existing classical economic policy of laissez-faire and minimal government interference.

Components of the Keynesian Theory

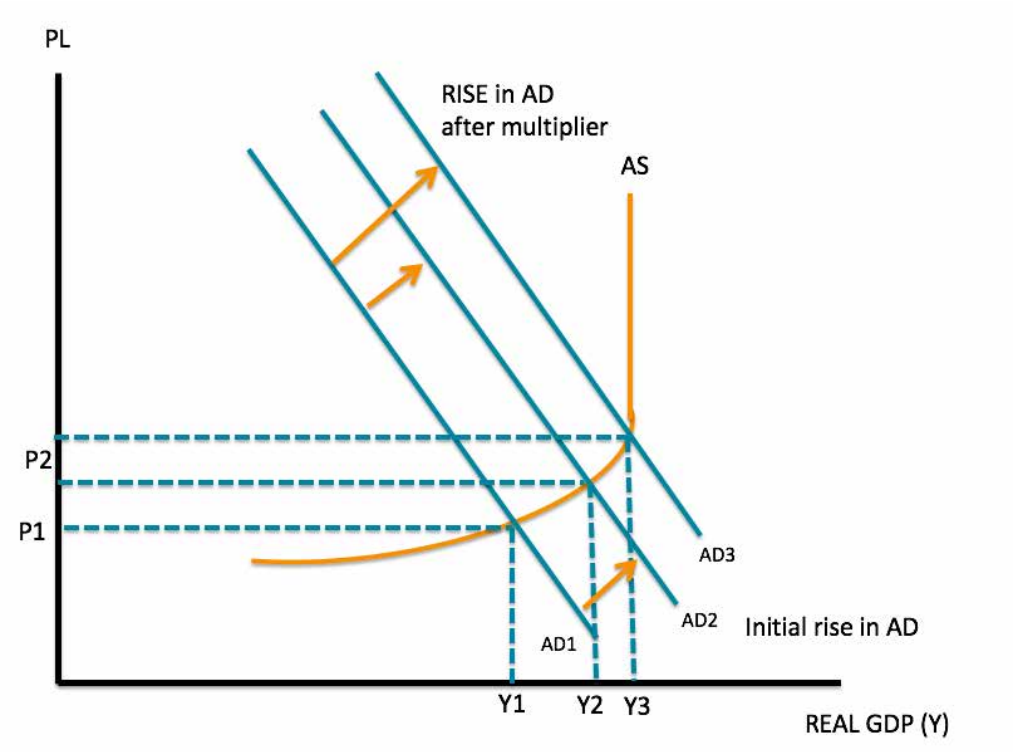
The three main components of the Keynesian Theory are:

Aggregate demand is influenced by the decisions in the private and public sector. The level of demand by the private sector could exert an effect on macroeconomic conditions. For example, a decrease in aggregate spending can bring the economy into a recession. However, the negative impact of private decision-making can be mitigated through government intervention with a fiscal or monetary stimulus.

Prices such as wages are often slow to respond to changes in demand and supply. It is why there are many instances of a shortage or an excess in the supply of labor.

A change in aggregate demand causes the greatest impact on the output and employment in the economy. Keynesian economic theory says that spending by consumers and the government, investment, and exports will increase the level of output. Even a change in one the components will cause total output to change.

The concept of the change in aggregate demand was used to develop the Keynesian multiplier. It says that the output in the economy is a multiple of the increase or decrease in spending. If the fiscal multiplier is greater than 1, then a $1 increase in spending will increase the total output by a value greater than $1.



(Image) The increase from AD1 to AD2 leads to an increase in output from Y1 to Y2. But with a multiplier, there is a rise to AD and a further increase in output at Y3.

Calculating the Keynesian Multiplier

The value of the multiplier depends on the marginal propensity to consume and the marginal propensity to save.

1. Marginal Propensity to Save

The change in total savings as a result of a change in total income is known as the marginal propensity to save. When an individual's income increases, the ***marginal propensity to save (MPS)*** measures the proportion of income the person saves rather than spend on goods and services. It is calculated as

$$\mathbf{MPS = \Delta S / \Delta Y}$$

Suppose an individual receives a year-end bonus of $600 and spends $300 on goods and services. The MPS is (600 – 300) / 600 = **0.5**.

2. Marginal Propensity to Consume

The change in total consumption as a result of a change in total income is known as the marginal propensity to consume. The ***marginal propensity to consume (MPC***) measures how consumer spending changes with a change in income. Using the figures above, the **MPC is ΔC / ΔY** = 300/600 = **0.5**.

The Keynesian Theory states that an increase in production leads to an increase in the level of income and therefore, an increase in spending. The value of MPC allows us to calculate the size of the multiplier using the formula:

1 / (1 – MPC) = 1 / (1 – 0.5) = **2**

This means that every $1 of new income will generate $2 of extra income.

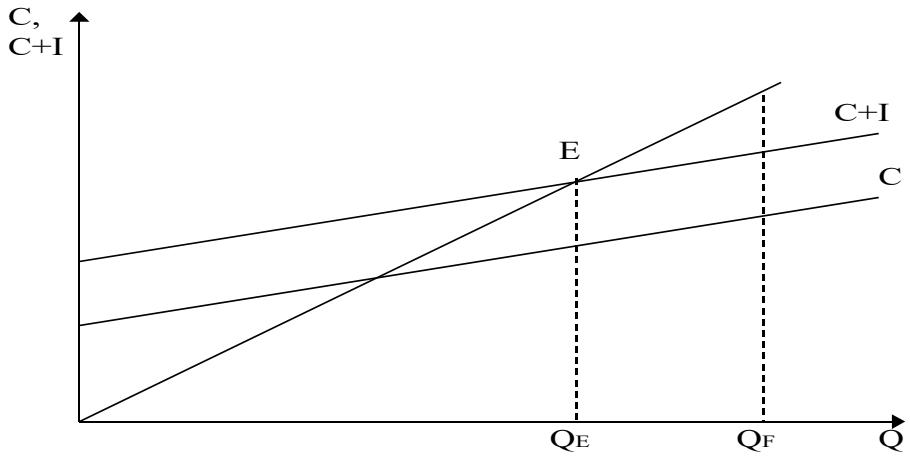
$$\mathbf{m = 1/1\text{-}c'}$$

Where, m – multiplier;

c' - marginal propensity to consume.

$$\mathbf{1/1\text{-}c' > 1 \quad m > 1}$$

Where, 1/1-c' - Keynes multiplier, shows how national equilibrium income is growing, when autonomous demand grows for one unit (graph 3.2).



Graph 3.2 The model of multiplier

John M. Keynes created a multiplier theory in the conditions, when society was in the big crisis with the high level of unemployment and with not used producing resources. In such cases we can see a multiplier effect. The increasing of investment in connecting with multiplier provide the full using of producing resources, which increase GNP and employment.

If economic is in full employment condition, the result of multiplier action will be prices and inflation level increasing, which are provoked by demand surplus, the GNP volume is not changed.

Government demand

Public expenditures (G) in macroeconomics modulation of aggregate demand (AD) are viewed as an exogenous number and is declaimed by government budget of the country. That is why it has such view:

G = const

One of the government costs element is public goods.

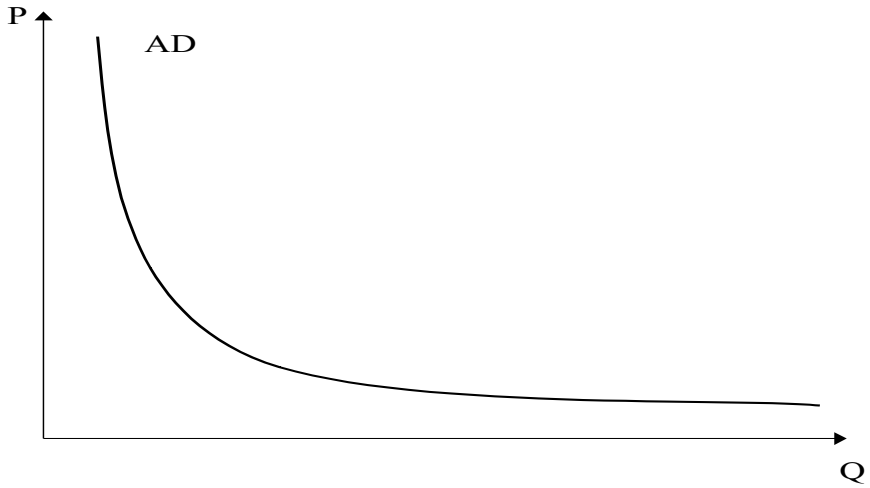
Public goods - this are goods and services of the public using (law control, nature control, national defence and others). Such goods are public used, and it does not depend on if they pay or not, and they are financed from taxes income to budget.

Demand from foreign countries

Demand from foreign countries goods of some country depends on the correlation of prices for national and world products and exchange course.

The aggregate demand curve

Graphically we can show it as curve AD, which has negative slope (graph 3.3).



Where, P - price level;
Q - produce volume.
Graph 3.3 The aggregate demand curve (AD)

The most important reason of the negative slope is a money supply effect: a price increasing nominal supply is constant, made money more "expensive" and accordance a small total costs.

AD curve shows a quantity of real costs, when other conditions are constants.

Price factors which have influence on the aggregate demand:

- interest rate change;
- wealth effects;
- import volume and structure.

A wealth effects

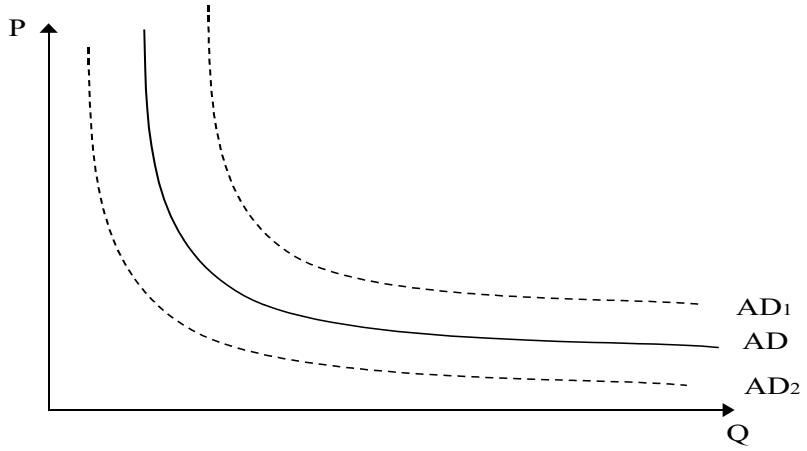
In high prices conditions real cost (purchasing power) of the finance active accumulations especially with fixed cost (deposits or obligations), will be reduced, - it means that citizens become more poor and we can see the reducing of consumption expenditure.

Non-price factors which have influence on the aggregate demand:

- change in consumption spending;
- change in investment spending;
- change in spending on net export;
- change in governmental spending.

Under the influence of non-price factors AD curve is moving:

- To the right top when demand is increasing ($AD \rightarrow AD_1$);
- To the left top when demand is decreasing ($AD \rightarrow AD_2$).



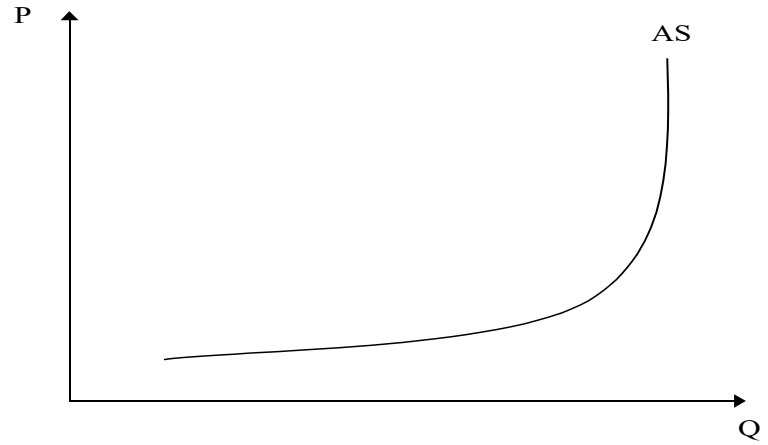
Graph 3.4 Influence non-price factors on the aggregate demand curve.

3. The structure of aggregate supply. The price and nonprice factors which define aggregate supply. The curve AS.

Aggregate supply (AS)

Aggregate supply (AS) is the volume of goods and services which firms are willing to produce and sell during the year per every price level.

AS curve shows the volume of real national product per every possible price level (graph 3.5).

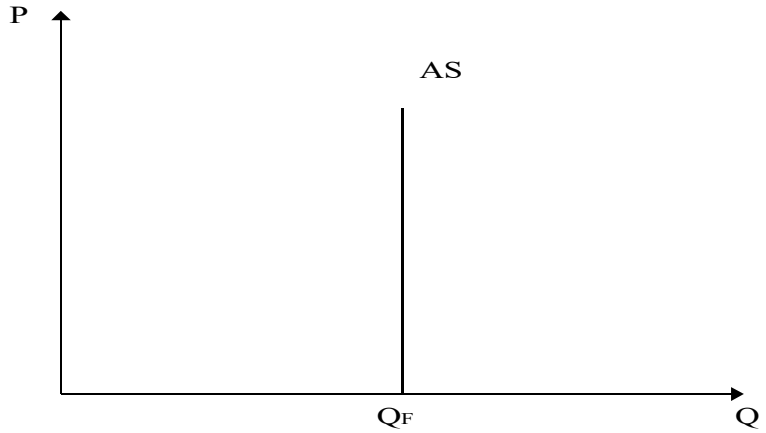


Where, P – price level;
Q – real manufacture volume;
AS – aggregate supply curve.
Graph 3.5 Short – run AS curve

AS curve reflects manufacture costs dynamics per product unit in connection with price level change.

For short-run period (few months or years) we talk about short-run curve of AS (graph 3.5).

For long-run period (few years, ten years or longer) we talk about long-run AS curve which is displayed as vertical line AS. It means that price increasing doesn't cause the growth of national manufacture volume in long-run period.



Where, P – price level;
Q – national manufacture volume;
Q_F – potential GNP
AS – AS curve.
Graph 3.6 Long-run curve of AS

Aggregate supply basically depends on potential volume of manufacture.

Potential GNP is such real volume of GNP produced in the country in conditions of complete employment, when actual norm of unemployment equals to natural level of unemployment. The newest researches estimate the natural level of unemployment approximately to 6% of workforce.

Modern economic science examines three parts of AS curve.

1. *horizontal piece (keynesian)* shows the changes in manufacture volume in conditions of complete employment and constant prices (depressive state of economy).

2. *intermediate piece (ascending)* shows the changes in GNP volume in conditions of complete employment when the level of actual unemployment equals to natural unemployment and additional growth of GNP doesn't take place and we can see an inflation price growth.

3. *perpendicular piece (classic)*.

Price factors which have influence on the aggregate supply:

- Interest rate change.
- Price level change.

Non-price factors which have influence on the aggregate supply:

- Change in price for resources:

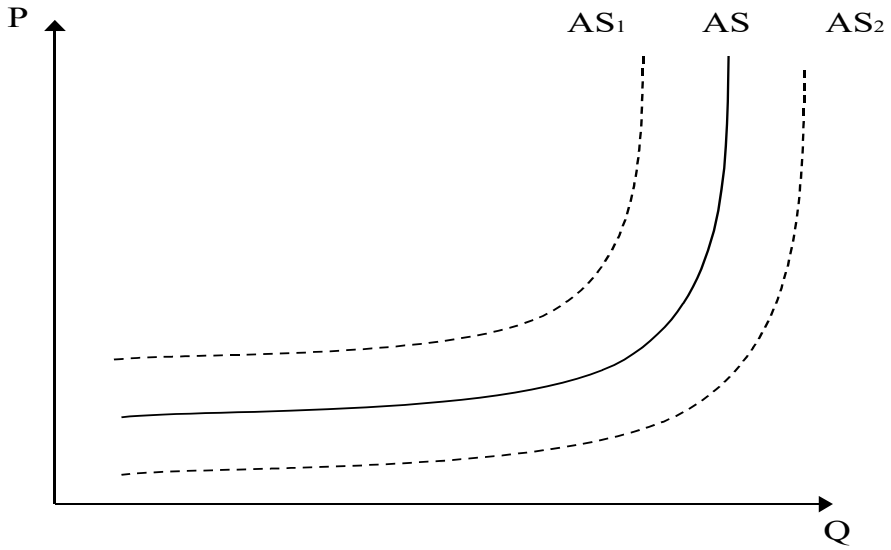
a) presence of own resources;
b) prices on import resources;
c) parity on the market of national and import resources.

- Changes of economic rules of law:

a) enterprise taxes and subsides

b) government regulation.

- Changes in work productivity.

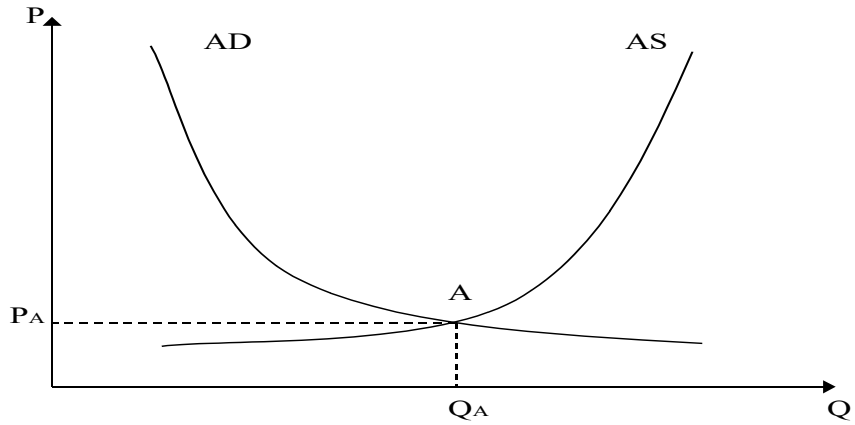


Graph 3.7 Influence of non-price factors on the aggregate supply curve (AS).

Under the influence of non-price factors AS curve is moving:

- To the lest top when AS is reducing as a result of manufacture costs increasing ($AS \rightarrow AS_1$);
- To the right down when AS is increasing ($AS \rightarrow AS_2$).

The equilibrium of aggregate demand and aggregate supply



Graph 3.8 The equilibrium of AS and AD

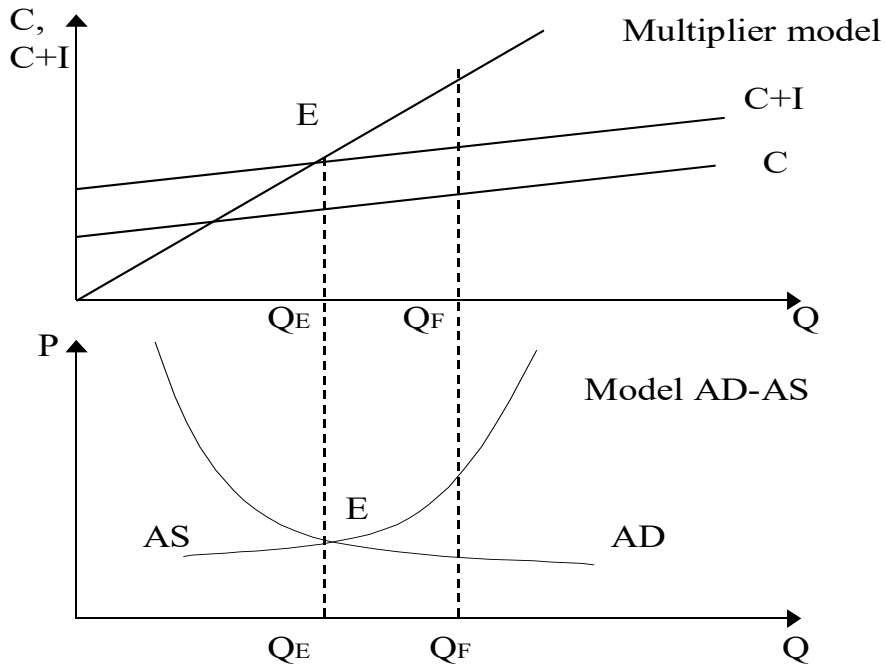
The point of crossing the AD curve and AS curve is the point of equilibrium which determine equilibrium price level (P_A) and equilibrium actual level of GNP manufacture (Q_A).

Three variants of macro equilibrium

- If aggregate supply is changing in limits of Kane's piece then demand growth causes the growth of real GNP volume and employment when the prices are constant;
- If aggregate supply is increasing on an intermediate piece it causes the growth of real GNP volume price level and employment;
- If aggregate supply is increasing on classic piece it causes inflation price growth and nominal GNP when real GNP volume is constant (because it can't increase more then the level of complete employment).

Multiplier in AD – AS model

Multiplier equilibrium gives the same level of manufacture volume as AD–AS equilibrium, both leads to real GNP which equals Q_E.



Where, C – consumption function;

C + I – aggregate demand growth under the influence of independent investments;

Q_E - equilibrium GNP;

E – equilibrium point;

Q_F - GNP in conditions of complete employment.

Graph 3.9 Interrelation of AD – AS and multiplier models.

A resolute restriction of the multiplier model is that it could be applied for the description of the depression or recession but it couldn't be applied for a complete employment period when real GNP volume outweighs potential level of manufacture.

5. The Neoclassical Interpretation

If you were to take a macroeconomics course back in the 1920s, it might have lasted only a few weeks, and your textbook would have been much narrower (and cheaper) than this one. The classical or neoclassical economists – that is, most economists before John Maynard Keynes – believed that the economy was depression-proof. They felt that automatic adjustment processes exist within a market economy to bring output back to full employment whenever it strays away. Although a recession or depression could occur as a result of exogenous disturbances such as war or a bad harvest, it would not last long. Flexible wages, prices, and interest rates would guarantee that output would head back to the appropriate level where the labor force was **fully** employed and all that was produced was sold. Patient policy-makers would simply do nothing and allow the automatic adjustments to run their course uninterrupted. Government policy would be unnecessary or actually harmful. *Laissez-faire* economics ruled. How such a view arose from their version of markets is the topic of this section.

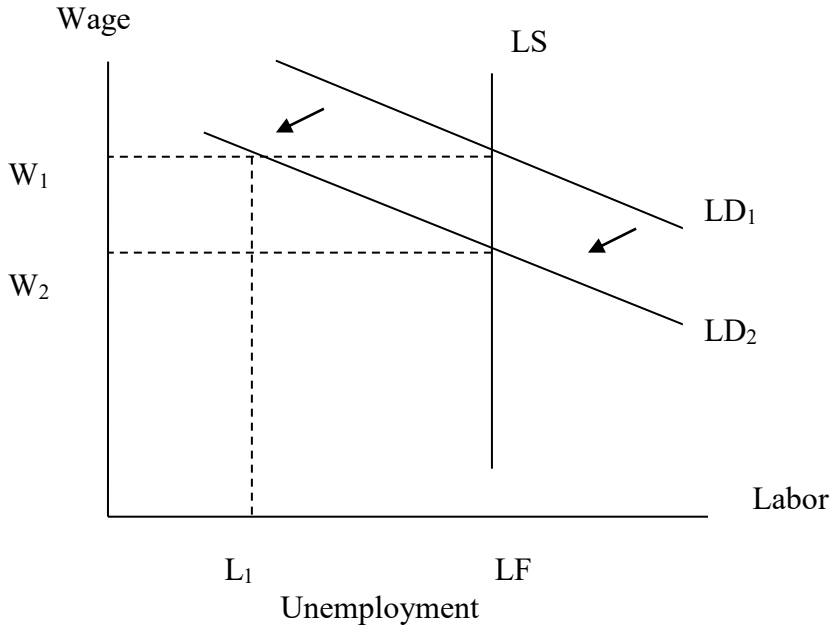
Wage and Price Flexibility

All economists labeled classical or neoclassical have had in common an unshakable belief in the efficiency of the market and its ability, through competition, to equate supply and demand. Only government intervention could prevent a market from clearing, they believed; movements in prices would guarantee that all markets would clear, that is, reach equilibrium. The existence of equilibrium in the product market and in the labor market at the same time means the economy is in equilibrium at full employment output. This is exactly where one would like equilibrium to be. Changes in *AD* or *AS* could disrupt this ideal combination, but only temporarily. Any excesses of demand or supply would be eliminated by movements in prices (which would produce adjustments in the quantities of *AS* and *AD)* and wages (which would result in changes in the level of *AS).*

The Labor Market In the neoclassical model, the short-run supply of labor is assumed to be fixed and equal to the labor force. Workers are presumed to be wage takers as opposed to wage setters, and it is assumed that all workers will accept the going market wage. Graph 3-10 depicts the neoclassical labor market model. Labor supply is fixed at *LF,* the size of the labor force. The level of labor demand is a function of the value of marginal product of the labor employed (marginal product times product prices). The market wage in the short run, is determined by the level of labor demanded and its intersection, or equality, with the fixed labor supply. When labor demand equals labor supply at w_1 the labor force is fully employed, and the economy is producing at full employment output.

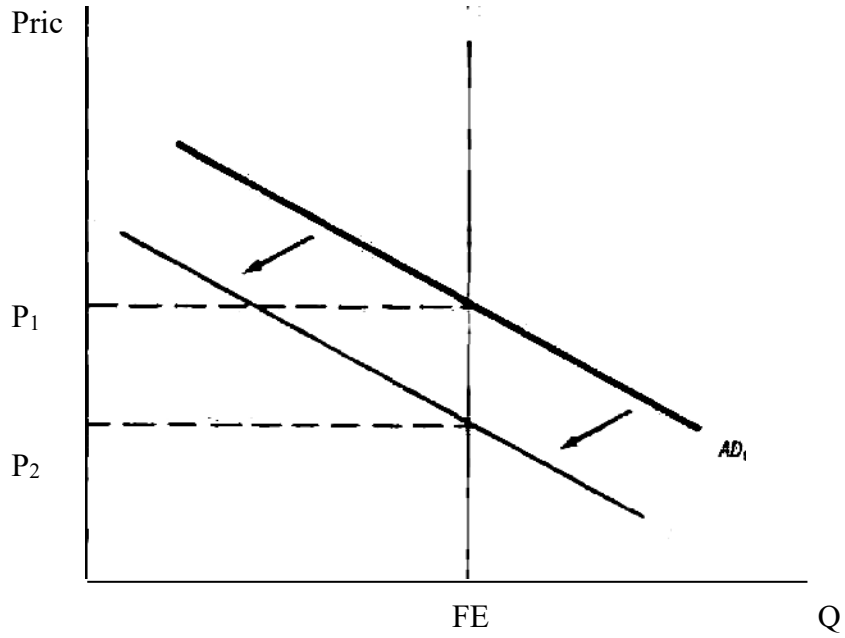
Let us consider a recession scenario. Suppose the level of *AD* falls for some reason so that *AD* is less than *AS* at full employment. With *AD* down, the level of labor demand will also be down. This is because inventories are rising and product prices are falling due to the slowdown in sales. Labor demand shifts from LD_1 to LD_2. At the wage w_1, the quantity of labor demanded is now L_1 compared to a quantity supplied of *LF.* Unemployment *(LF* minus L_1) exists in the labor market. In a

perfectly competitive labor market, unemployment causes wages to fall. Unemployed workers would rather work at a lower money wage than receive no wage at all. Employers would rather hire such workers than pay w_1. As wages fall, the quantity demanded of labor rises until it reaches *LF* at w_2, where supply again equals demand. The economy is back to full employment. Workers would supposedly be willing to accept such money wage cuts because product prices, and therefore the cost of living, would be falling. At the end of the adjustment process, real wages are the same, but prices and money wages are lower. Most importantly, exactly *LF* workers are again employed. Output automatically adjusts back to full employment *(FE)* – that is, whatever output *LF* workers produce.



Graph 3.10. Neoclassical labor market

The* AS *Curve Given that output automatically moves to full employment, the economy's *AS* curve looks like the one in Graph 3-11. At all positive prices, output is equal to full employment. Any drop in the level of AD, such as from AD_X to AD_2, will create an excess of *AS over AD* and cause prices to fall. The deflation continues until the quantity of *AD* rises to meet *AS* at *FE.* The recession is over. Equilibrium output always lands back at full employment. Perfectly functioning product and labor markets eliminate excess supplies through price and wage declines. A *deflation* (a decline in *P)* is possible, but not a *depression.*



Graph 3.11 Neoclassical deflation

Say's Law and the Interest Rate

Wage and price flexibility was the ingredient that allowed the neoclassical economists to guarantee that the quantity of *AS* would always linger around the full employment level. In order to prove that *AD* would always be in the same neighborhood, they relied upon Say's Law and the flexibility of interest rates. The combination of the two guaranteed that *AD* would always match *AS.* With *AS* already shown to be at the full employment level, this meant that *AD* would always be sufficient to support the full employment level of output.

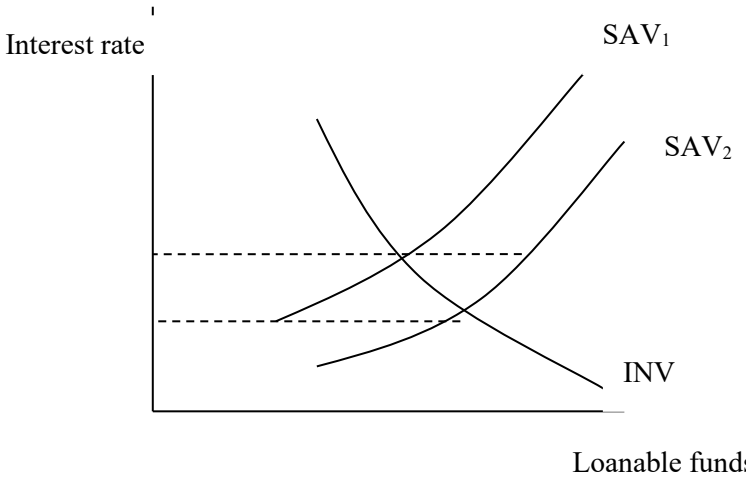
That is, there could never be a lengthy excess of *AS* over *AD* or a lengthy depression.

Say's Law Authored in its original form by Jean Baptiste Say at the beginning of the nineteenth century, Say's Law states, in its most simple form, that supply creates its own demand. Say was an intellectual descendent of a group of French political economists, the physiocrats, who are credited with the recognition and development of the circular flow model of an economy. A dollar's worth of output generates a dollar's worth of income, which flows to the household sector. In this simplified model with no government, the household sector has the *ability* to purchase all that is produced. Thus, supply does create its own *potential* demand. Say stated that no one produces except to consume. Therefore, in the aggregate, demand would have to equal supply. Essentially, Say said: C = output *(Q).*

Say was describing a barter economy – that is, one without money. In such an economy saving is unlikely. But in an economy that has currency, saving is not only easier but very likely. When saving exists, it brings with it the likelihood of consumption falling short of *Q,* which would leave an excess supply of goods, a *glut* in the language of Say's era. But every economist from Say through Pigou felt that investment would automatically match saving, leaving *AD* equal to *Q.* The

mechanism by which investment and saving are equated was felt to be the loanable funds market, where movements in the interest rate guarantee that all that is produced is demanded and sold.

A Flexible Interest Rate Graph 3-12 pictures the loanable funds market wherein household savings are channeled to investors as if the market were one big savings-and-loan company. The suppliers of loanable funds are savers, while the demanders of loanable funds are the investors who borrow these funds. The higher the interest rate, the more savers will save and the less investors will borrow. At some interest rate, r_e in Graph 3-12, saving equals investment, the loanable funds market is in equilibrium, and so is the product market. What is crucial to the neoclassical model is that the interest rate automatically moves to r_e. If the interest rate is higher than r_e, saving exceeds investment. In order to attract more borrowers and fewer depositors, our giant savings-and-loan company would be forced by profitability constraints to lower the interest rate toward r_e. Should the interest fall below r_e, the excess of borrowers over savers would drive the interest rate back up to r_e. Saving always equals investment.



Graph 3.12 Loanable funds market

The flexibility of the interest rate brings a quick end to any depression or recession. Suppose consumers decide to greatly reduce their level of spending. This means the level of saving must rise as the shift in the saving curve from SAV_1 to SAV_2 depicts in Graph 3-12. This results in saving being greater than investment at r_e. Since S is greater than I, AS is greater than AD, and a glut of goods exists. Unsold goods should force producers to lay off workers and lower prices. But that will not be necessary. The excess of saving over investment causes the interest rate to automatically fall, and as the rate falls, investment rises and saving falls. Since saving falls, consumption rises. With both I and C rising, AD is clearly rising. When the interest rate reaches r_f, I equals S and, therefore, AD equals AS. The recession is over, brought to an end by the flexibility of the interest rate. Whatever output is produced, it will be sold as long as interest rates are allowed to vary and automatically seek an equilibrium level.

Government's Role Given that the labor, product, and loanable funds markets automatically adjust to a full employment general equilibrium, what is the government's role in ending a recession? None at all. The economy can cure itself. Any effort by government officials to help the economy might only slow the process by which wages, prices, and interest rates fall. The correct policy for the government is a hands-off policy. Stabilization policy is unnecessary and unwanted. Since the economy automatically maintains full employment, the government has no control over real variables such as output at full employment, employment, real wages, and real interest rates except in the very short run. Government manipulations can affect *AD* and real variables only temporarily. The only variable that the government can determine is the price level. How that is accomplished is what we will consider next.

Money and the Price Level

Apparent to economic observers in Europe, at least as far back as the sixteenth century, was the direct, positive relationship that existed between the quantity of money in an economy and that economy's price level. The gold and silver imports from the New World drove prices up steadily for 150 years in what has been called the Price Revolution. David Hume, among others, formalized the relationship between money and prices in the quantity of money equation of exchange (described earlier):

$$\textbf{money} \bullet \textbf{velocity} = \textbf{output} \bullet \textbf{prices}$$

or

$$MS \bullet V_{FS} = NI = \mathbf{Q} \bullet P$$

In that equation, final sales velocity is a measure of the average number of trips that a unit of currency makes through the circular flow in a year.

With four variables moving all at once, the equation tells us very little. But the neoclassical economists narrowed things considerably. First, they observed that velocity varies little in the long run, so changes in the money supply necessarily lead to changes in money *NI*. In addition, in the world of neoclassical economics, the economy is always at full employment. This means increases in the money supply will not cause real *NI* to rise. Thus, with velocity and output constant, changes in the money supply translate directly into changes in prices, and only prices. That is the *quantity theory of money.* Double the money supply, and the price level will double. Halve the money supply; prices halve. Changes in the money supply may have temporary effects on real variables such as output and employment, but eventually those money supply changes will show up only in changes of the level of prices. Monetary policy can create inflation or deflation but not a real contraction or a real expansion. But then, in an economy at full employment, who would want to meddle with monetary policy anyway.

6. The Keynesian Interpretation

John Maynard Keynes was educated in the neoclassical tradition. In fact, his teacher at Cambridge was Alfred Marshall, the dean of neoclassicism. But, as is the case for many leaders of revolutions, Keynes saw contradictions between the model and the real world. Keynes broke from the Cambridge tradition in the 1930s with the publication of *The General Theory of Employment, Interest, and Money.* In that work Keynes outlined his disputes with the neoclassical model and offered an alternative interpretation of the workings of the labor, product, and loanable funds market. Most importantly, Keynes's prescriptions for ending recessions and depressions called for explicit government involvement. Laissez-faire policy died with the advent of Keynesianism. That is part of what made Keynes's philosophies so revolutionary. The relationship between government and the economy has never been the same since; nor has macroeconomics.

The Keynesian Critique

Keynes's complaints against the neoclassical interpretation came in two forms. He pointed out that the real world did not work as smoothly as the perfectly competitive neoclassical model. That is, wages and prices are not as flexible as the model presumes. He also seriously questioned the fundamental relationships between saving and investment and the interest rate; and in so doing, did great damage to the contention that the economy automatically adjusts to full employment without the government's help.

The Labor Market Keynes's background in England, where unions ruled the labor market, made it impossible for him to believe that the money wage cuts that would supposedly eliminate unemployment during a recession would ever happen. If all workers were brought together and convinced that wage cuts would not only not hurt them, but might help them, then it might be possible for wage declines to be well-received. But the labor market does not function that way in reality. Union leaders balk at money wage cuts. Thus, in spite of the existence of widespread unemployment, wages are stubbornly slow to decline, and the labor market stays in disequilibrium. Involuntary unemployment persists, and output remains below full employment. Downwardly rigid wages make for long-term unemployment. Only an increase in the level of *AD,* which will generate an increase in labor demand, will eliminate such unemployment.

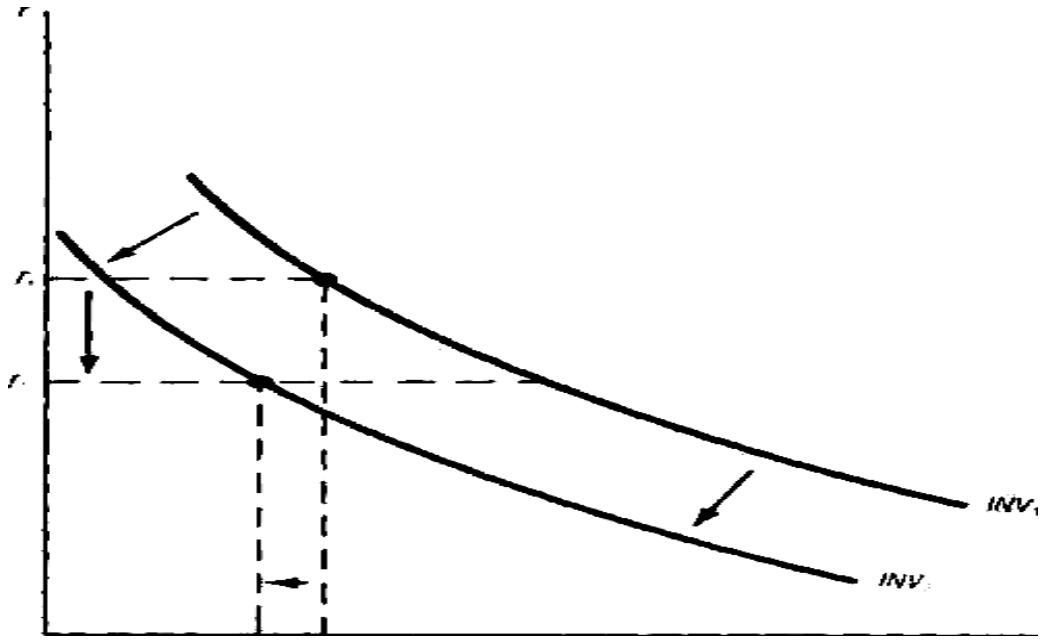
Deflation Keynes also had little faith in the positive results of deflation. It is true, Keynes said, that falling prices will generate an increase in the quantity of AD. But, he argued, declining money incomes due to declining production will cause the *level* of *AD* to be falling even while the quantity of *AD* at any given level is rising. That is, the *AD* curve could be shifting left possibly as fast as prices fall, leaving *AD* well short of *AS* at full employment. Besides, in an economy where prices and wages are declining due to low sales and unemployment, a negative psychology and loss of confidence develops. Deflationary expectations actually cause people to slow their buying, which further reduces the level of AD. Here Keynes is describing a drop in

velocity. In general Keynes felt that it was unlikely that a recovery would rise from the ashes of a deflation of wages and prices.

The Interest Rate Keynes's criticism of the neoclassical view of the loanable funds market was much more fundamental. He did not believe that the interest rate is determined by the interaction of saving and investment. Instead, he theorized that interest rates are determined by the supply of and demand for liquidity. (We will study his liquidity preference model more closely. Keynes did not foresee interest rate movements equating saving and investment. Not only is the interest rate not determined in the neoclassical loanable funds market, said Keynes, but neither saving nor investment is such a simple function of the interest rate as the neoclassicists represented it.

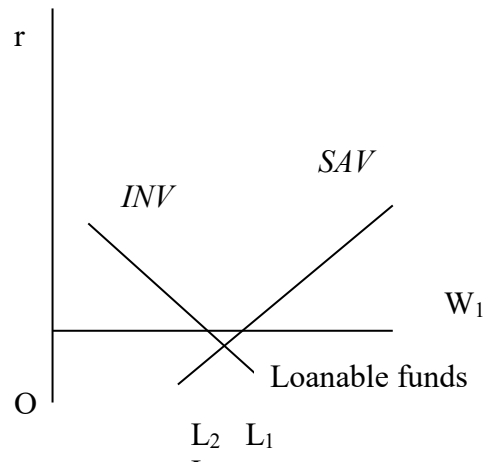
Keynes disputed the premise that saving varies significantly in accordance with the interest rate. He believed that saving is a function primarily of disposable income – that a consumer's consumption is based upon his or her disposable income, and saving is simply disposable income minus consumption. In other words, consumers make their saving decisions based upon the amount of disposable income left after consumption. Changes in the interest rate thus have little impact on this decision. This view contrasts sharply with the neoclassical view that consumers spend whatever is left after the saving decision is made. The declining interest rates that accompany a recession will have little positive impact on saving rates, and therefore on consumption, if consumers act as Keynes predicted.

According to Keynes, investment – *that is, purchases of capital – is a function* of the interest rate and of the expected rates of return on investment. Potential buyers of capital compare the expected rates of return on their planned investment projects against the interest rate, which is the opportunity cost of money. All else being equal, lower interest rates will bring forth greater investment. But during a recession, all else is not equal. The declining sales that are part of a recession drive down the expected rates of return on most investment projects. It is not unusual during a recession for expected rates of return to fall faster than interest rates, causing investment to fall in spite of declining interest rates, as Graph 3-13 illustrates. According to Keynes's view, the investment curve in Graph 3-14 would be shifting left during a recession at the same time that the saving curve is shifting right. This event opens up the possibility of the saving and investment curves intersecting at negative interest rates. In such a case S is greater than I and AS is greater than AD at all positive interest rates, and an automatic recovery is impossible.

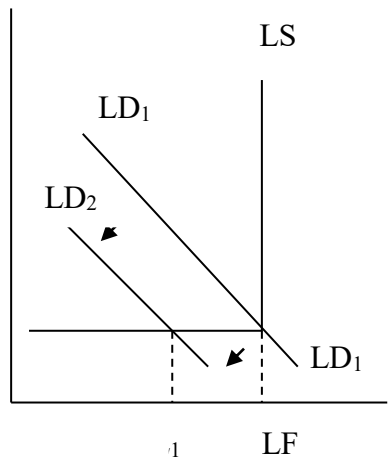


Graph 3.13 Falling expected rates of return on investment

In the Keynesian world, interest rates, no matter how flexible, might not eliminate a shortfall of *AD.* And if wages and prices are not downwardly flexible, we cannot expect deflation to bring the quantity of *AD* back up to the level of full employment output. An equilibrium between *AD* and *AS* at a level of output below full employment is very likely.



Graph 3-14 Negative equilibrium



Graph 3-15 Keynesian interest rate labor market

Keynes's Aggregate Supply The only assumption needed to convert the neoclassical model of *AS* to the Keynesian model is wage rigidity. If wages will not fall in the face of unemployment, producers cannot afford extensive price reductions. Output will fall below full employment and stay there when *AD* is low. Let us see what wage rigidity does to *AS.*

Graph 3-15 depicts a Keynesian labor market with absolute wage rigidity in the downward direction. With labor demand at LD_X, the equilibrium wage is w_1, and *LD* equals *LS* at full employment. Suppose the level of *AD* falls, causing the *LD* curve to shift to the left to LD_2. At w_1, *LS* exceeds *LD*, and unemployment exists. In the neoclassical model, wages would fall until *LD* equals *LS* again at *LF*. But in the Keynesian scenario, wages do not respond, and employment falls to L_1, which is the quantity of labor demanded now at w_1.

Since employment is below *LF*, output falls below full employment. It is very unlikely that deflation will occur here, since wages will not fall and allow costs to decline. The result is an L-shaped *AS* curve like that in Figure 3-16. Price levels below P, are not acceptable to producers, since wages will not fall below w_1. Should *AD* drop from AD_X to AD_2, labor demand would shift from LD_1 to LD_Z, employment would fall to L_1, and *AS* would drop to Q_1 and stay there in equilibrium below full employment. The key to whether equilibrium output lies below full employment or not, according to Keynes, was the level of **aggregate expenditures** *(AE)* – Keynes's version of *AD* in a world with constant prices (and wages and interest rates for that matter). If the level of aggregate expenditures falls short of output at full employment, protracted unemployment is possible.

Aggregate Expenditure Theory

The emphasis on the level of *AD* in modern theories and policies is a product of Keynes's *General Theory*. Keynes held that what determines whether an economy experiences a recession, full employment, or inflation is the level of aggregate expenditures. Theory and policy have been demand-side oriented ever since massive increases in government expenditures in the 1940s abruptly ended the Great Depression and apparently proved Keynes was right. He argued that the level of *AE* is likely to vary as a result of changes in **autonomous expenditures –** Keynes's version of exogenous determinants of the level of AD, that is, variables that change the velocity of money. Keynes believed that a better understanding of aggregate expenditures and their determinants would allow policy-makers to adjust the level of expenditures in order to counteract undesirable changes in their level.

In order to study the level of aggregate expenditures, Keynes divided them into three main parts (omitting net foreign expenditures):

AE **= consumption expenditures + investment expenditures + government expenditures**

That looks a lot like the division of *AD* that we said could be made earlier in this chapter. In fact, the difference between the terms *aggregate demand* and *aggregate expenditures* is very small. Both *AD* and *AE* are the sums of the desires of spenders in all sectors to buy goods and services in the product market. Aggregate expenditures can be viewed as simply aggregate demand in a Keynesian world of fixed wages, prices, and interest rates. Thus, *AE* is a specialized case of *AD*. For our purposes, however, *AD* and *AE* are essentially the same. When we discuss Keynesian models, particularly the income-expenditure model in the next chapter, we will use

the term *expenditures* to emphasize that these models carry Keynes's specialized assumptions with them.

Given his three-way division of *AE,* Keynes went on to provide separate theories for the determinants of consumption expenditures and investment expenditures. Since most government expenditures are determined by political decisions, Keynes considered government expenditures to be the ultimate example of an autonomous expenditure variable, a variable whose determinants lie outside the model.

Consumption Keynes posited that consumption expenditures, or simply consumption *(C),* are primarily determined by the level of consumers' disposable income *(DI).*

$$C = c\ (DI)$$

Although he was not the first to establish this direct relationship, he was the first to set it out in a rigorous, testable format. Keynes's basic consumption theory states that as disposable income rises, so does consumption; and when disposable income falls, consumption falls. Critical to Keynes's consumption theory is his *fundamental psychological law,* which states that while a consumer's spending moves up and down with his or her disposable income, the change in spending is less than 100 percent of the change in disposable income. That is, the ratio of the change in consumption to the change in disposable income is less than 1. Keynes called this ratio a consumer's **marginal propensity to consume *(MPC).***

$$\frac{\text{change in consumption}}{\text{change in disposable income}} = \frac{\Delta C}{\Delta DI} = MPC < 1$$

The term *marginal propensity to consume* is a mouthful, but it simply means the fraction that a consumer tends to spend of any income increase. If a consumer's *DI* rises by $1,000 and his or her C rises by $900, that person's *MPC* is .9 or 9/10. We would expect that a $1,000 decline in income would produce a $900 decline in consumption. What about the other $100? That goes into saving (if *DI* rises) or comes out of saving (if *DI* falls). Logically, each consumer has a **marginal propensity to save *(MPS)*** equal to 1 minus the *MPC.*

$$\text{Since } DI = C + S,\ S = DI - C$$
$$\text{and } \Delta DI = \Delta C + \Delta S$$
$$\text{and } MPC + MPS = 1$$

Keynes also allowed for other less important autonomous variables to influence consumption, but the *MPC* concept establishes a link between changes in *DI* and *AD* by proposing a simple relationship between C and *DI.* It is a relatively easy task to estimate a consumer's *MPC* or an economy-wide *MPC.* It is also possible to estimate the influence of autonomous variables on the level of consumption, and

we will assign them the symbol *C*. With those two pieces of information, one can formulate a Keynesian consumption function:

$$\boldsymbol{C = \overline{C} + MPC \cdot DI}$$

With such a formula, it is possible to estimate the quantity of consumption expenditures at any level of disposable income.

Investment In the Keynesian model of the economy, investment expenditures, or simply investment (*I*), is the most volatile part of *AE*. The two main variables that Keynes saw determining the level of investment are interest rates and the expected rate of return on the capital investment. Whether a potential investing firm has the financial capital already or must borrow it, the interest rate is the opportunity cost of the capital. In order for an investment project to be profitable, its rate of return must exceed the interest rate. What makes investment demand so subject to change is the fact that both the interest rate and business people's revenue expectations vary a great deal. Changes in the cost of money and the likely profitability of using the money can lead to significant swings in the levels of *I* and *AE*.

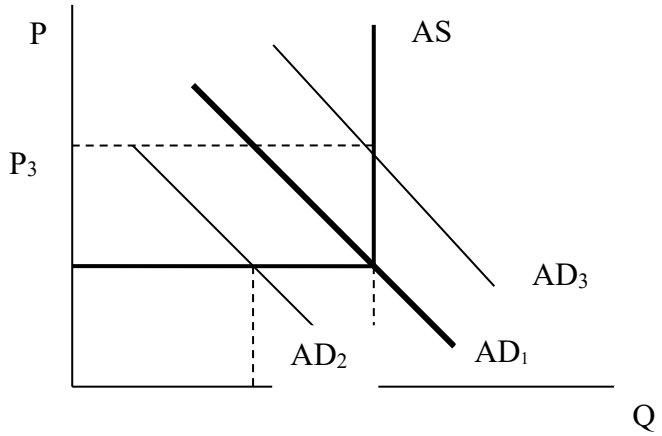
Investment projects, such as purchasing machinery, are meant to add to a firm's profits. It is difficult, however, to calculate how profitable a machine will be, because the increased revenues that it is supposed to generate are in the future, while the cost of buying the machine is in the present. In calculating the expected rate of return for a machine, a firm must predict the likely net revenues that will be generated over time and compare them to the costs.

It is obvious that the revenues must at least exceed the cost of the machine. In order for the machine to be truly profitable, the revenues must exceed the cost by enough to cover the interest payments. If the money to buy the machine is borrowed, it is clear that revenues must pay for both the price tag on the machine and the interest on the loan. Otherwise, it pays not to borrow. If the firm has the money already, it has the option of lending the money to someone else and earning interest instead of buying the machine. Again, net revenues must cover both the price tag and the interest earnings that could have been received by simply lending the money. Either way, the investment project is profitable if, and only if,

the expected rate of return > interest rate

The level of investment will change, according to Keynes, if either of these two variables change. All else being equal, investment moves in the opposite direction of the interest rate. A rise in the interest rate, reduces the profitability of potential investment projects, which leads to a reduction in investment. Should the interest rate fall, investment will rise. Hold the interest rate constant, and investment will move in the same direction as the profit expectations of potential investors. A wide variety of autonomous variables can influence the expected rate of return on any investment project. Consequently, *I* is much more difficult to predict than C.

Equilibrium and Full Employment What truly set Keynes apart from his theoretical predecessors was his contention that while automatic adjustments lead the product market to an equilibrium between *AD* and *AS,* this equilibrium need not occur at full employment. In the Keynesian model, full employment is the goal, and equilibrium is the reality. *AD* can equal *AS* at an output level below full employment, while labor demand can equal labor supply and still leave the quantity of labor demand lower than the labor force. With both the product and labor markets in equilibrium, and wages resistant to declines in spite of unemployment, output will stay at Q_1 (in Graph 3-16). Without wage declines, there is no automatic process that will bring output back up to *FE.* This is the Keynesian equilibrium below full employment: the economy is stuck in the middle of a recession or depression.



Graph 3.16 Keynesian AD-AS model

What this economy needs is more *AD.* If the level of *AD* were to increase, shifting the *AD* curve from AD_2 back to AD_1, the level of labor demand could rise, and *Q* would rise to *FE.* Unless that increase in *AD* is somehow generated, output will stay at Q_1 indefinitely.

Should the level of *AD* rise to the extent that the *AD* curve shifts farther to the right than AD_1 (to AD_3), inflation will result. Such an increase in *AD* will cause *AD* to exceed output at full employment. Since *AS* is limited in real terms to *FE,* all that can happen is that the excess of *AD* will cause prices to rise above P_1. As prices rise, *NI* rises above *FE,* but real *NI* stays at *FE.* The inflation will cause the quantity of *AD* to fall until *AD* equals *AS* at P_3. Equilibrium money *NI* has risen, and the entire rise comes in the form of rising prices.

Thus, in the Keynesian world equilibrium can occur at money *NI* levels above or below full employment. Either inflation or unemployment occurs if *AD* is not exactly equal to *AS* at *FE.* Unemployment can be cured with an increase in the level of *AD;* inflation can be halted with a decrease in the level of *AD.* Fighting one problem need not cause the other, and both inflation and unemployment will not exist at the same time.

The Role of the Government Since the economy is very likely to settle into equilibrium at output levels below full employment, it is destined to experience

unemployment. To Keynes, there were no automatic forces that would bring the economy out of a depression. Inflation would eliminate excess *AD,* but deflation would not eliminate excess AS – unemployment would simply result. If the economy is unable to generate a level of *AE* consistent with equilibrium at full employment, then it is the government's responsibility to adjust *AE* through its spending and taxing powers in order that equilibrium can land right at full employment. Fiscal policy was born, and *laissez-faire* died with Keynes.

Notice that all Keynesian policy prescriptions refer to changes in *AE.* Keynesian economics is demand-side macro. His level of output is strictly a function of the level of *AE. NI* rises or falls only as a result of changes in the level of *AE,* according to his theory, never as a result of changes in the level of *AS.*

7. A Modern Synthesis

The neoclassical and Keynesian models represent opposite extremes. The former assumes perfect wage and price flexibility, while the latter assumes complete wage and price rigidity (at least in the downward direction). The neoclassical model portrays an economy that no longer exists, if it ever did, and the Keynesian system is only truly applicable to an economy in the middle of a depression. As one might expect, the modern real world lies somewhere between the two extremes. Wages and prices can certainly display downward inflexibility in the contemporary economy, but then it is difficult to tell how upwardly rigid they are during inflationary times. Clearly, however, the modern *AS* curve is not perfectly horizontal at income levels below full employment nor perfectly vertical at full employment output.

Since the *AS* curve is not perfectly vertical at full employment, it is possible for the product market to be in equilibrium at output levels below and above full employment. Unemployment and inflation are not only possible, but likely. Since the *AS* curve is not shaped like an L on its back, as the most restrictive Keynesian assumptions suggest, inflation and unemployment are not mutually exclusive, and policy prescriptions are not as simple as Keynes implied. Let us reproduce the model we developed in the first part of this chapter and reaffirm the picture of the economy that we want in the back of our minds (and often in the front) throughout the rest of the book. If we now return to the macro model that we derived, we can see that it is a bit of a compromise between the neoclassical and Keynesian interpretations.

Figure 3-8 is reproduced in Figure 3-17 to portray our models of *AS* and *AD* and reaffirm what the shapes of the curves tell us. *AD* can be divided into three main parts as Keynes divided it, and we will often use that breakdown. Regardless of the subdivision, however, all parts of AD obey the *law of demand* in that the quantity of *AD* rises when the price level falls, and falls when the price level rises. Aggregate supply obeys the *law of supply* at all income levels, with greater quantities of *AS* coming at the cost of higher prices. Let us compare our model with its predecessors.

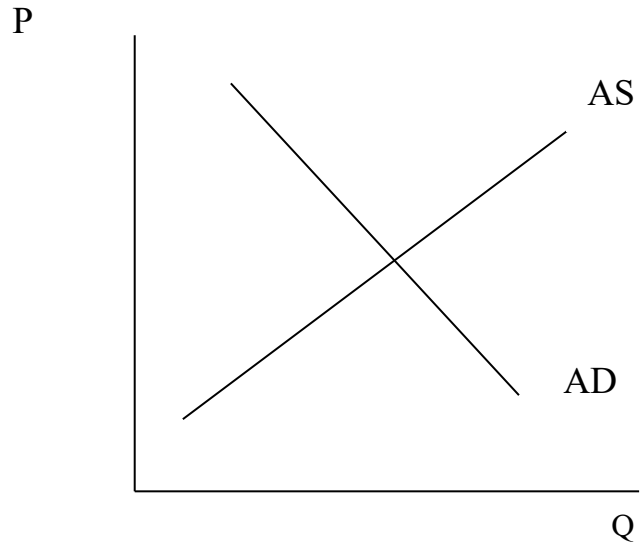


Figure 3-17 The modern models *AD–AS*

Aggregate Demand

As described earlier, the *AD* curve represents how the quantity of *AD* varies with changes in the general price level. The lower the general price level, the greater is the quantity of output that can be purchased with the same money income. The location of the *AD* curve is determined by the level of *AD,* which is most fundamentally a function of the two most basic determinants of money income (money supply and the velocity of money). Multiplied together, they determine money *NI.* The level of *AD* rises only when either or both of the money supply or velocity increases, and thereby increases the spending power of all three sectors.

In regard to the level of AD, the easiest way to distinguish between the neoclassical and Keynesian points of view is to note the differences in their emphasis. The neoclassical economists argued that it is changes in the money supply that primarily bring about changes in the level of *AD.* They admitted that unusual events could occur that would lead to temporary variations in velocity, but they maintained that these variations were infrequent and of minor importance. And, regardless of whether the level of *AD* is changed by adjustments in the money supply or velocity, these changes in *AD* would ultimately only affect the price level.

To Keynes, the level of *AD* was critical, since he believed that full employment equilibrium is not automatic. Keynes emphasized his "autonomous" changes *(exogenous* in our terminology) in all three parts of *AD.* He was well aware of the impacts of money supply changes on the level of *AD,* but he believed that the level of autonomous spending was of greater direct importance to it. And no form of spending is more autonomous or supposedly more controllable than government spending. Changes in government spending could be expected to change the level of spending within Keynes is not speaking of changes in the money supply, he must be speaking of changes in the velocity of money. His variations in autonomous spending require changes in the rate at which money circulates through the circular flow.

The neoclassical economists, as well as the monetarists of today (who are really neo-neoclassicists), believed that most lasting changes in the level of *AD* come from

changes in the money supply, with very little happening to velocity. In sharp contrast, Keynesians deemphasize the influence of money over the level of *AD* and concentrate instead on changes in the level of autonomous spending. These latter changes presume significant variations in the velocity of money.

In Chapter 10, after we have studied a Keynesian income-expenditure model and the fiscal policy prescriptions that derive from it, and after we have covered the money market and the monetary policy formulas that derive from it, we will reconsider this disagreement about the relative importance of the two fundamental determinants of the level of AD, the money supply and velocity. At that time, we will try to establish which view is more reliable and under what circumstances the relative reliability varies. Until then, we will speak of a number of variables that can influence the level of *AD,* such as income, the interest rate, exogenous portions of consumption and investment, government spending and taxes, and demand-side inflationary expectations. Keep in mind that these variable influences are all just subcategories of changes in the money supply or velocity.

Aggregate Supply

No horizontal or vertical sections exist in our *AS* curve. Virtually every supply curve in the individual factor markets, including labor, capital, energy, and so forth, slopes up and to the left. This shape reflects market imperfections that are magnified as the short-run limit to supply is approached. The composite of all of the factor supply curves shapes the *AS* curve. Few factor supply curves are perfectly horizontal or vertical; therefore, the *AS* curve should not be either horizontal or vertical. Factor price flexibility keeps the *AS* curve from being horizontal, but a significant degree of factor price rigidity keeps it from being vertical. Factor and product markets are neither as efficient as the neoclassical economists saw them nor as rigid as Keynes assumed them to be.

Although wages and prices are to some degree downwardly rigid in our economy today, they are not perfectly rigid, and they never have been. During recessions, producer prices fall even when retail prices are still rising, and labor unions do accept pay cuts in the face of low demand in their industry. Labor concessions at Chrysler and other struggling firms a few years back showed us that. And, most importantly, prices must and do rise as output rises from levels below full employment. Thus, the *AS* curve rises gradually until output nears the full employment level. When output reaches full employment, factor market conditions work to push up factor costs at an increasing rate. This is because factor supplies are reaching their limit and output is nearing capacity. Although the *AS* curve does become very steep, it is never perfectly vertical. A little more output can always be squeezed out. As *AS* nears capacity, that squeeze becomes increasingly more expensive. Thus, the *AS* curve we will envision is always upward sloping with the degree of the slope being minimal at output levels below full employment. But that slope steepens and rapidly increases as output passes full employment.

Short-run reductions in factor costs cause the *AS* curve to shift downward, while long-run improvements in productivity of any input cause the *AS* curve to shift down and to the right. The rightward shift is a long-term economic growth change.

Any increase in factor costs that are initiated on the supply side will shift the *AS* curve straight up. In general, shifts of factor supply curves cause shifts in the *AS* curve. Stated another way, changes in the availability of factors of production cause changes in the ability of the economy to supply output at any given price level.

That completes our preliminary look at the theoretical background for the model of *AD* and *AS* that we will use in this book to analyze the product market. We will put that model on the back burner for a while, though, while we look at a Keynesian income-expenditure model for determining the equilibrium level of output in the product market and an equilibrium model of the money market. The Keynesian model is rife with limitations because it assumes constant prices and interest rates. It was designed for an economy with plenty of excess capacity, unutilized factors of production, and a slack money market. While that economy may be unrealistic, the model allows for a specific quantification of *AE* and *Q* that is very informative and useful to our ultimate goal of understanding the entire macro economy.

Chapter 4
National market and its equilibrium

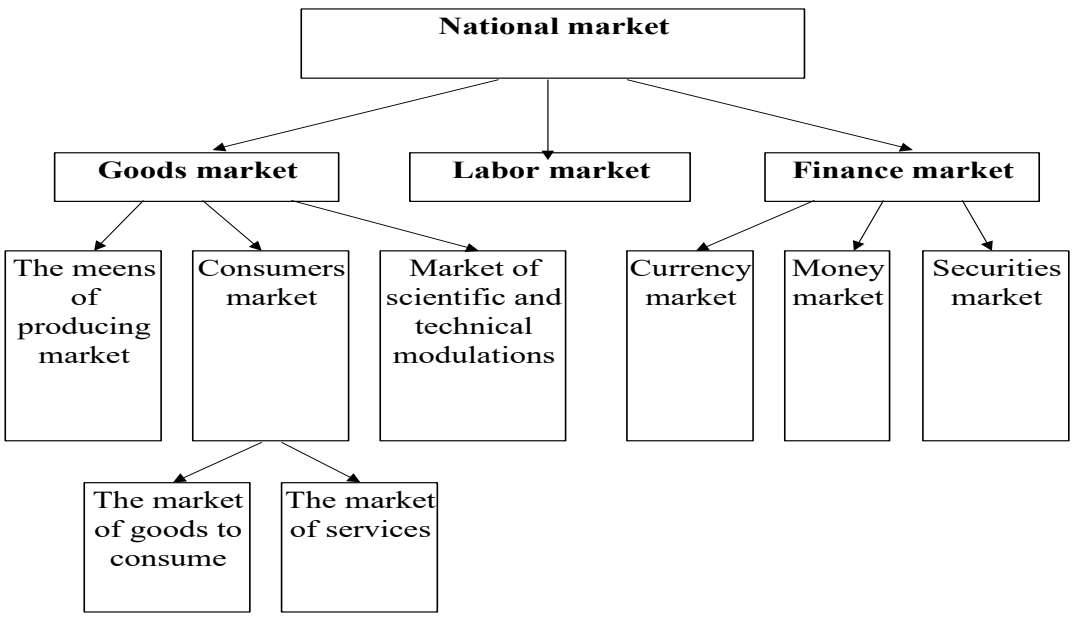
In this chapter we will explore:

1. Objects, subjects and structure of national market
2. The market of goods and paid services
3. Money and securities market
4. The labor market and its equilibrium

1. Objects, subjects and structure of national market

National market - is an aggregate of the social-economic relations in the sphere of change, which helps to sell products and services, selling and buying of workforce, exchange of capital.

National market structure



The main components of the national market are: the market of goods and paid services, money and securities market, workforce market.

The subjects of national market are all macroeconomics subjects: state, enterprises, households, foreign.

2. The market of goods and paid services

The market of goods and paid services is a system of the economic relations between customers and traders because of goods and services movement, which satisfy investment and consumer demand of macroeconomics subjects.

Consumer demand - is a solvent demand of the households on:

- the goods of long using (transport, existence subjects);
- using goods;
- services (own servants, dwelling, health protection, education, etc.)

Investment demand - the demand of businessmen on good for:

- upgrading of used capital
- increasing of real capital

In this market of goods the foundation of dealing the firms with the households is a proportion, in which the income (**Y**) is divided on consumption (**C**) and saving (**S**):

$$Y=C+S$$

The consumption is a personal and collective using of the consumption good, which is directed to the satisfying the material and spiritual needs of people.

Saving demand is an economical process which is connected with investments. This is the part of income, which still unused after sharing of firm's money on current producing needs, and on consumption needs in households.

The equilibrium on the market of goods and paid services in the open economy is when saving supply equal to investment demand.

Saving supply (**S**) is a function from income (**Y**):

$$S=S(Y)$$

Conditions of equilibrium of the goods market in the open market economy including the State activity:

$$I=S-\Delta ZB-G$$

Where I – investments
S – saving;
ΔZB – foreign trade saldo;
G – governmental expenditures.

3. Money and securities market

The monetary market is the market of short-term credit operations on which demand for money and their supply determine a level of the interest rate (that is the price).

The market of money is created as a result of interaction of National bank with commercial ones, and also as a result of interaction of commercial banks.

Demand for money is represented by the commercial banks, the enterprises, the households and a state.

The supply of money is given by National bank.

Demand for money is determined by desire of economic subjects to have the certain amount of payment means (cash) at the order.

There are two basic motives of demand for money:

1. operational
2. speculative.

Operational demand for money which basis is operations of the purchase and sale depends on an interval of time between the moments of reception and usage of money resources. If the interval is shorter, so demand for money will be smaller, and on the contrary.

$$M_1 = r \cdot P \cdot Q$$

Where, M_1 - operational demand for money;
r - delay between reception and usage of money resources;
P - price level;
Q – quantity of manufacture.

Speculative demand for money is determined by interest rate (**i**):

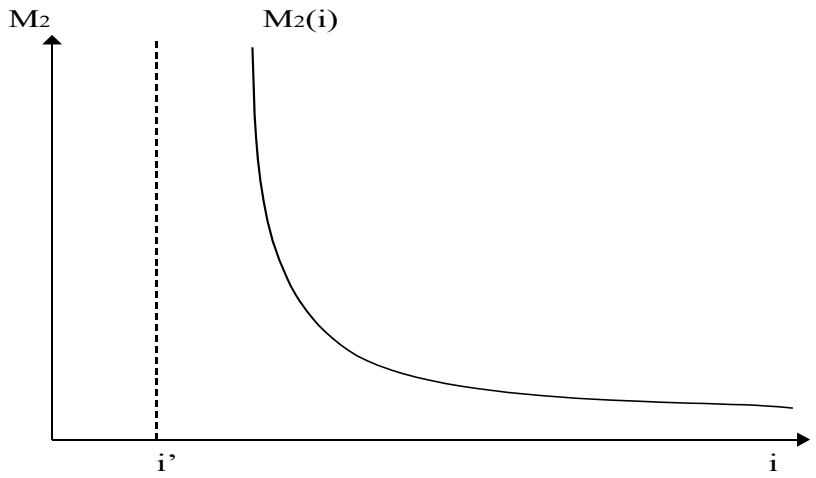
$$M_2 = M_2 (i)$$

If the norm of interest is low, it is observed a high rate of securities that weakens stimulus to contributions to them of liquid means by the risk connected with falling of a rate of securities caused by growth of interest rate (i), and on the contrary.

$$SR = D / I \cdot 100\ \%$$

Where, SR - stock rate;
D - dividends;
i - interest rate.

There is such interest rate, at which economic objects cease (to stop) to put liquid means in securities (a liquid trap i') (graph 4.1).



Graph 4.1 Dependence of speculative demand on interest rate.

4. The labour market and its equilibrium.

The labour market represents a system of economic relations between its subjects owing to the purchase and sale of labour services which are offered by the employees behind the prices which develop under influence of a ratio of a supply and demand.

Subjects of the labour market are employers and the employees.

Objects of the labour market are conditions of employment and quality of labor services.

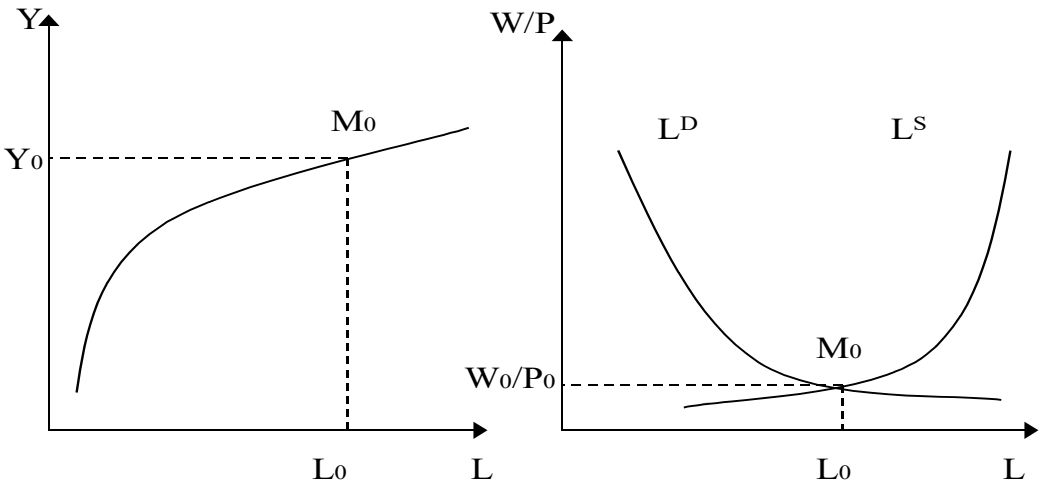
The labour demand (L^D) is a solvent need of employers for labour services of the workers of certain professions and qualifications.

The labour supply (L^S) is a variety and quality of labour services which are offered for realization.

The price of a labour demand is represented as a maximal possible rate of salary from the point of view of the businessman for the employed workers.

The price of supply is represented as the minimal salary which satisfies those who is hired.

The equilibrium at the labour market is established when the labor demand is equal to the supply **($L^D = L^S$)** and the level of salaries satisfies both employers and the employees.



Graph 4.2 Equilibrium of the labor market.

Chapter 5
Tactical fluctuations of economy

In this chapter we will explore:

1. The nature and specificity of cyclicity of economic dynamics. Cycles and crises.
2. Classification of main macroeconomic variables according to its cyclical properties.
3. Anti-crisis policy.

1. The nature and specificity of cyclicity of economic dynamics. Cycles and crises.

The research of economic cycles gives general notion about macroeconomic dynamics.

An economic cycle is characterized by periodical increasing and falling of business activity which is represented in a form of discrepancy of demand and supply. In a general view economic cycle is a result of fluctuation of different economic activity proofs (rate of increasing of GDP, general quantity of sales, general price's level, rate of employment, loading of a production potentialities).

The direction and degree of change set proof (or proofs) that are characterized development of economy is called economic conjuncture.

Theory of economic cycles is also called theory of conjuncture.

General duration of cycle is measured by time (month, year, etc) between two next higher or lower points of economic activity.

By duration economic cycles are divided on short (small) – fluctuation of business activity by 3-4 years; middle – fluctuation of business activity by 7-13 years and big (long) – the periodicity of 30-40 years.

Short cycles

Short cycles are connected with renovation of equilibrium at consumption market.

The material base of short cycles are processes that exist in the sphere of monetary relationship. Short cycles are divided by monetary crisis which are repeated with certain laws.

By content monetary crisis which are represented as crisis of sphere of monetary turn-over and credit.

Middle cycles

Middle cycles (industry cycles) are connected with a change of demand on means of production.

The material base of middle cycle periodicity is renovation of fixed capital.

The main property of industry cycles is fluctuation of increasing rate of GDP for period of time when economic system moves through four consecutive phases: revival, rise, boom, falling.

The duration of falling is measured by time between higher and next lower point of business activity, and rise – between lower and next higher point of business activity.

The economists call fluctuation ratio between consumption and investments the most important reason of cyclicity in economy.

Recession *– the falling of national production quality during 6 month and till year.*

Dispersion *– the falling of quantity of national production which is accompanied by high level of unemployment and proceeds for a few years.*

2. Classification of main macroeconomic variables according to its cyclical properties.

There are such macroeconomic parameters as:

Procyclic parameters. They have a tendency to increase in the period of economic rising and to reduce at phase of economic falling. At the same time procyclic parameters include:

1. Parameters which have a high coordination with cycle:
- Total issue;
- Issue in branches of economy (at whole);
- Monetary aggregates;
- Short-term interest rate;
- Price level.

2. Parameters which have a low coordination with cycle:
- Production of goods of the daily usage;
- Production of agriculture goods and extraction of natural resources;
- Prices on agricultural products and natural resources;
- Long-term interest rates.

Cyclic parameters. Its dynamics does not connect directly with business cycle, for example, export.

Anti-cyclic parameters. They have a tendency to increase at the period of economic falling and to reduce at phase of economic rising, for example, the stocks of ready products, the stocks of means of production, unemployment rate, bankruptcy rate.

The economic crisis is characterized:
- Overproduction of goods rather with solvent demand;
- Falling of price level in consequence of excess supply on solvent demand;
- Reducing the quantity of production;
- Mass bankruptcy of industrial, banking, trade firms;
- Increasing of unemployment and reducing of nominal salary;
- Failure of credit system.

In difference of this classical circuit of crisis, in Ukraine, as at the same other countries of USSR, it has a place the crisis of underproduction than overproduction one. The duration of falling phase is from 0,5 to 1,5 year in western countries, it was lasting for 5 years. The depth of falling of GDP and industrial production in western countries did not exceed 10% during post war years, in Ukraine it was up 25%.

Big waves

The material base of big cycle is a change of basic technologies and generations of machines (jumping in line of technical progress), renovation of infrastructure objects.

Big cycles have two phases:

- First phase – rising one (25-30years);

This is long-term rising that appears on the base of revolution jumps of technology and its mass distribution.

- Second phase – falling one (20-25years), it is already called the "great crisis".

The crisis appears when old structure of economy proceeds to conflict with requires of new technology, but it does not ready to changes. In this period the crisis of middle and small cycles show sharply itself.

3. Anti-crisis policy

Anti-crisis (conjuncture) policy is directed on regulation of fluctuation of economic activity in society during before crisis states and elimination of economics crisis development.

There are two main periods which must be located under especial control – the periods of depression and boom.

The most important actions of anti-crisis policy	
At the period of booms	At the period of depression
Monetary and credit policy	
Increasing of discount rate	**Reducing of discount rate**
Sale of the state securities at the open market	Purchase of the state securities at the open market
Rising of norms of obligatory banking reserves	Rising of norms of banking reserves
Reducing of state budget costs	Marginal costs of state budget
Fiscal policy	
Increasing of tax rates	***Reducing of tax rates***

Characteristics of depression:

- Reducing of production investments;
- Increasing of stocks;
- Reducing of labor demand;
- Sharp falling of norm of pure profit.

Characteristics of revival

- Transition to proof expansion of manufacture;
- Increase of demand on active elements of means of manufacture (equipment, machines, mechanisms etc.);
- Increase of demand on raw material (metal, fuel, energy etc.);
- Increase of demand on a labor;
- Increase of wages and according to demand for the goods of personal consumption.

Characteristics of economic boom:

- Significant gain of the industrial investments;
- Reduction of stocks;
- Sharp increase of demand on a labor;
- Significant gain of a general price level.

Chapter 6
Economical growth

In this chapter we will explore:

1. Economical dynamics: economical growth and its types.
2. Economical growth factors: increasing rates of GNP.
3. Economical growth models.

1. Economical dynamics: economical growth and its types.

The most common definition of economical growth is:

- actual growth of NP volume in result of increasing of manufacture factors or techniques and technologies improvement;
- growth of actual GNP volume or actual income per person.

Types of economical growth

There are such types of economical growth:

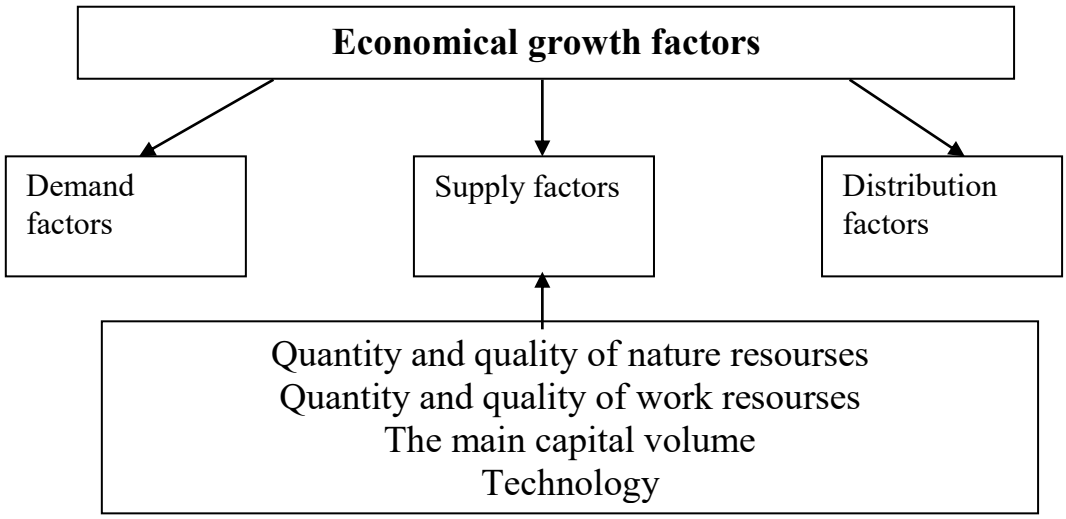
Intensive – growth of manufacture potential through technique and technology improvement.

Mixed (actual) – growth of manufacture capacity in result of increasing of the using manufacture factors quantity and technique and technology improvement.

Extensive – manufacture capacity growth in result of increasing of the using manufacture factors quantity.

2. Economical growth factors: increasing rates of GNP.

Among the most important economical growth factors we should admit such factors as:



General representation about the interaction of these factors can give manufacture capacity curve. This curve reflects association of different variants of production manufacture, which could be produced having this quantity and quality of natural, work and main capital resources with this level of technological potential.

Sources of economical growth

Manufacture volume gain (ΔQ) can be reached due to three separated sources:

Labour increasing (ΔL);

Capital increasing (ΔK);

Technical innovation (T. I.).

According to manufacture volume growth per year is determined by this fundamental alignment:

$$\mathbf{\Delta Q = \alpha\ \Delta L + (1+\alpha)\ \Delta Q + T.P.}$$

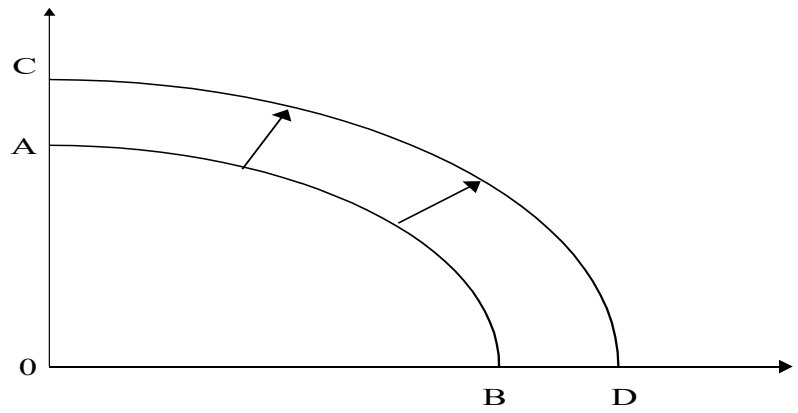
Where, T.P. – technological progress (or aggregate productivity of manufacture factors);

α,(1-α) – relative entering of every manufacture factor to economical growth according to other relative part of NI, which can be changed during some time.

In the economically advanced countries the increasing of work productivity is provided on 70-80% due to T.P.

Economical increasing and manufacture opportunities curve

The economical increasing is determined by movement of the manufacture opportunities curve to the right that is from AB to CD (diagram 6.1).



Graph 6.1 Manufacture opportunities curve

Gain of quantity and quality resources and technology improvement provides an opportunity of such movement. Complete employment and optimal distribution of resources have an essential importance for its realization. Rates of economical increasing.

The information about rates of economical increasing is given by such parameter:

$$\textbf{Rate of increasing of GNP} = \mathbf{GNP_1 / GNP_0}$$

Where, GNP_1 - gross national product of current year;

GNP_0 - gross national product of base year.

Economic development

Economical development	=	Economical growth, that is the character of using of productive forces of society	+	Evolution of economical system in general

3. Economical increasing models

The main problems of economical increasing theory are:

- the tendencies and sources of increasing;
- maintenance of long-working stability;
- consequences of the elected technological politics;
- rates of updating and national facilities structure;
- measurement of the factors and results.

Neoclassical model

The basic entry condition of the neoclassical concept of economical increasing is the assumption that each factor of manufacture "provides" the appropriate part of the produced national product. The basic tool of the neoclassical analysis of economical increasing is production function:

$$\mathbf{Y = F(a_1 + a_2 + ... + a_n)}$$

$$\mathbf{Y = dF / da_1 \cdot a_1 + dF / da_2 \cdot a_2 + \ldots + dF / da_n \cdot a_n}$$

Where Y - volume of a product;

a_i - manufacture factors (workforce, capital, ground, enterprise abilities);

dF / da_i - marginal product of i factor.

Thus, according to the given formulas a product volume is determined by the sum of multiplied products of each factor on its marginal product. The rational contents of manufacture function answers to the attempt of reaching a maximal volume of products. With a interchangeability of the factors of manufacture the manufacture function can be used as the analytical tool at planning the rates of economical increasing and other important macroeconomical proportions.

Model of economical increasing by Robert Solow.

For development of this model R. Solow was awarded to the Nobel Prize (1987).

The basic attributes of model:

1. As the base of increasing Solow took the growth of labour productivity (y = Y / L), not a products growth (Y).

2. The model takes into account the influence of three factors:

- capital capacity (k = K / L);
- population increasing (ΔL);
- technological progress (T.P.).

3. Behind his model there is a proof level of capital capacity i (k*), which determines an economical dynamics. This proof level of capital capacity (k*) can be determined through the formula:

$$\mathbf{S / A = k^* / f(k^*)}$$

Where, S - norm of the savings;
A - norm of amortization;
k* - proof level of capital capacity;
f(k*) - labour productivity with a proof level of capital capacity.

The sources of economical increasing by Solow:

1. The increasing of capital capacity (k), which depends on increasing of savings norms (s).

But the increasing of savings norms can not be constant, as the savings (S) limit consumption (C).

Solow formulated "a gold rule", which is carried out under the condition that gross product of capital (GPC) equals to its departure (amortization - A):

$$\mathbf{GPC = A}$$

"A gold rule": Defining the norm of savings the criteria should be taking as the maximization of society wealth, which means the biggest consumption (**C**).

2. The increasing of the population ($\mathbf{t_L}$ - rate of population increasing) influences on economical increasing through the dynamics of capital capacity.

$$\mathbf{\Delta K = i / L - (A + t_L)k}$$

Where, i / L - investment per one worker;
A - norm of amortization;
t_L - rate of population incresing;
k – capital capacity.

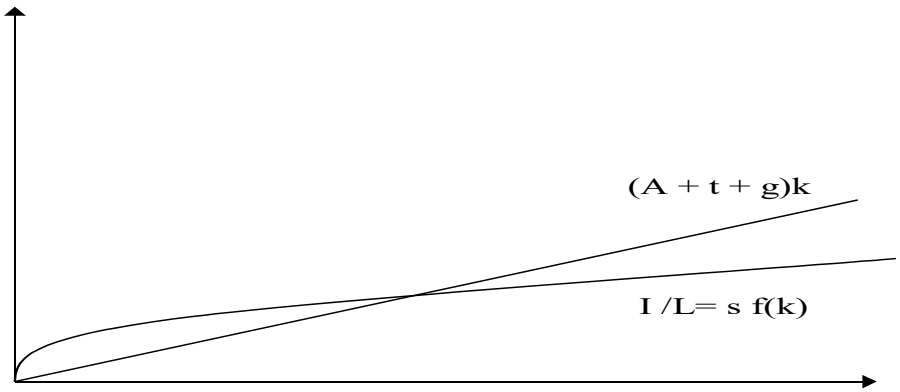
3. The technological progress, which, according to the model, differently from previous factors is a source of constant increasing both the productivity of labour (y), and general product (Y).

If the manufacture efficiency (E) under the influence of technological progress changes with a rate (g), then the productivity of labour changes with the same rate, and total volume of manufacture grows with rate $t_L + g$.

$$Y = (t_L + g)\, y_0$$

Where, y_0 - basic productivity of labour.

Model of economical increasing by R. Solow is represented on the diagram 6.2.



Where, k – capital capacity of labour unit with constant efficiency;

k* - proof condition of capital capacity, when sk = I, which means that the size of the capital, which leaves, equals to the capital, which is invested (I = sf (K));

A - norm of amortization;

g - rate of increasing of a manufacture efficiency under the influence of technological progress.

Graph 6.2 Model of economical increase by R. Solow

Neokeynesian model of an multiplier – accelerator

$$Yn = (1-s)Y_{n-1} + b(Y_{n-1} - Y_{n-2}) + I_n a$$

Where, Yn - national income in n year;

s - part of the savings in the national income;

(1-s) - part of consumption in NI;

b - factor of an acceleration;

Y_{n-1} - national income in (n-1) year;

Y_{n-2} - national income in (n - 2) year;

$I_n a$ - independent investments in n year.

In the given formula both sides of dependence between the national income and investments are displayed.

Neokeynesian macroeconomical of models for a necessary condition of economical increasing consider the equality of the investments as the savings, which means full realization of means, which goes on accumulation. The inequality of these sizes is considered as an attribute of infringement of economical balance.

The excess investment above saving should mean the lack of means to the investment demand, and excess saving above investment - incomplete employment of resources. The task of economical regulation consists of achievement of full usage of

the national income as the source of effective demand, in condition that the sum $\Delta C / \Delta Y + \Delta S / \Delta Y$ should be equal to a unit.

Part Two: National and world economy

Chapter 7
Fiscal policy of the state

In this chapter we will explore:
1. The concept of fiscal policy.
2. Multiplications of fiscal policy of the state.
3. Automatic stabilizers and discretional stabilizing policy.
4. State budget and budget restriction.
5. State duty.

1. The concept of fiscal policy

Fiscal policy is the set of state measures in the sphere of taxes and state costs.

The main functions of fiscal policy:

- the influence on the condition of economic conjuncture;
- redistribution of the national income;
- accumulation of the necessary resources to finance the social program.

The main resources of income:

- taxes;
- own incomes of the state from manufacture and other types of activity;
- payments for the resources, which according to current legislation, belong to the state;
- the loan in the form of the state bonds.

To the fiscal policy of the state belong such manipulations of the state budget, which don't change the amount of money in revolution.

Taxes

The main resource of the state incomes in civilized countries is taxes.

From economical point of view taxes are financial relations between the state and taxes payer in purpose to create nation-wide centralized fund of money means, necessary for the state to do its functions.

Functions of taxes

- Distributive: distribution of the created GNP between the state and legal and physical persons.
- Fiscal: centralization of the GNP part in budget to society needs.
- Adjusting: the influence of taxes on different sides of activity of taxes payers.

Principles of structure of tax system:

- Generality: taxes scope of all economic subjects, who receive incomes independently on organizationally legal form.
- Stability: high guarantee level that, stipulated by the Budget Law incomes, will be received in full volume

- Compulsion: compulsion of taxes, inevitability of its payment, subject independent in its calculation and payment.
- Social validity: establishment of the tax rates and tax privileges, which put all subjects in approximately equal conditions and make softer tax burden on low-income enterprises and groups of population.

We have to differ the source and the subject of taxation.

Source, independently on the subject of taxation, is net income of society.

Subject is quantitatively determined economical phenomenon, which serves as the base for charging taxation.

The subjects of taxation are:

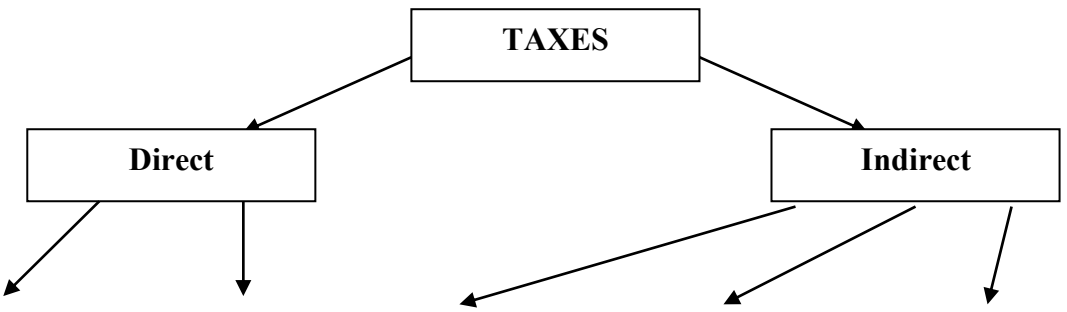
- Income (from enterprises or population).
- Property (immovable and mobile).

Dependently on mechanisms of taxes formation taxes are divided into to two groups: direct and indirect.

- direct taxes - are withdrawn directly from owners of property, receivers of incomes;
- indirect taxes - are withdrawn in sphere of realization or consumption of goods and services, which means that they are shifted on the consumer of production.

Direct taxes, because of increasing of prices, could be shifted on the consumer.

Taxes classification according to the subjects of taxation



Real	Personal	Fiscal monopolies	The excises	The customs duty
• ground • domestic • on valuable papers	• income tax from population • on corporations income • on capital growth • from inheritance and gifts • property tax	• individual • universal (revolution tax) • added value tax	• on some kinds of goods	origin tax: • export; • import; from goals: • fiscal; • protection; • anti-damping; from rates: • specific; • advaleric; • mixed

The more country is involved the bigger part of receipts goes to direct taxes. The poorer the country is the more it shifts on indirect taxes, especially on taxes from external trade.

Close to the objects in the system of taxation we can see tax rates and tax privileges.

Tax rate

Tax rate is legislatively established size of tax per taxation unit.

- Marginal tax rate is the ratio of growth of paid taxes to income growth:

$$T(Y)' = \Delta T / \Delta Y$$

- Average tax rate is the ratio of taxes volume to the size of income, which is taxied:

$$T(\tilde{Y}) = T / Y$$

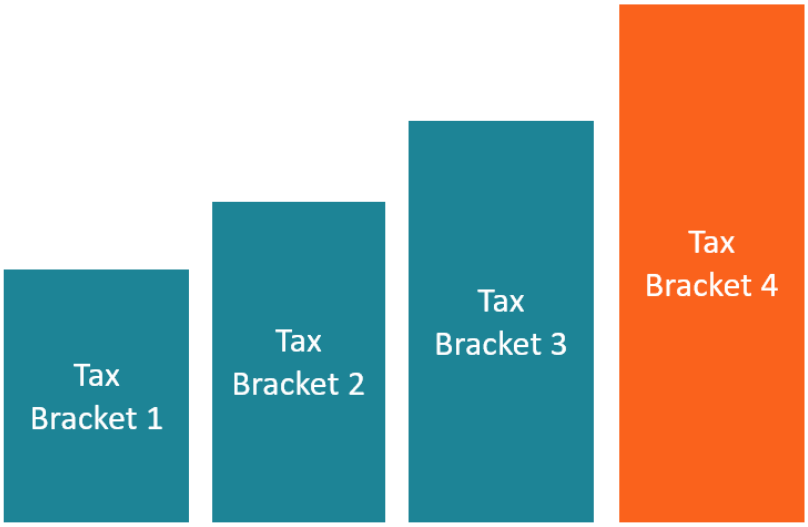
- Zero rate
- Privileged rate

Tax privilege is reduction of tax rates or full clearing from taxes of separate enterprises or manufactures dependently on their profile, character of manufactured production and fulfilled work, used workforce, zone of location.

Classification of taxes dependently on ratio attribute between tax and income rate

Progressive	Regressive	Proportional
Average rate increases if income increases	Average rate decreases if income increases	Average rate doesn't change independently on income size

A progressive tax is a tax rate that increases as the taxable value goes up. It is usually segmented into tax brackets that progress to successively higher rates. For example, a progressive tax rate may move from 0% to 45%, from the lowest and highest brackets, as the taxable amount increases. In a progressive tax system, a taxpayer's marginal tax rate is higher than their average tax rate.



Various tax methods that governments may use include progressive, regressive, digressive, or proportional. The Progressive Tax System is one where the tax burden increases as taxable income increases. In some instances, there is a minimum tax-free amount where individuals earning less than the stated minimum taxable amount are not liable to submit any returns to tax authorities.

Examples of Progressive Tax

Investment income taxes: These are taxes on most of the income-generating activities. They mostly fall on those with excess money to save and engage in investment.

Tax on interest earned: Interest is only earned from savings or investments. Those who can manage to do these things are taxed.

Rental earnings: Although there is a chance to deduct all the costs associated with building operations, once they are done, this is a very progressive kind of tax since it targets those who invest in rental property.

Estate tax: This is a form of tax levied against those who succeed a deceased. It applies only if the value of the estate of the deceased is above a certain amount as set by the government.

Tax credits: These are benefits and perks awarded to less fortunate citizens by the government to save them some cash. They are many and might include earned income tax credit, elderly and disabled tax credit, child tax credit, or retirement savings contribution credit.

Advantages of Progressive Tax

- There is a proper distribution of tax burden. Those with broader financial shoulders carry the heaviest burden.
- There is a safety net for the less fortunate in the society to ensure their tax burden is not crippling.
- The government receives a lot of revenue, as compared to a proportional tax system.

Progressive vs Regressive Tax System

The opposite of the progressive system is the regressive tax rate where tax liability reduces as the taxable amount increases. Regardless of the rate used, the government aims to collect money from citizens. After pooling all the money together, it can provide public goods and services such as infrastructure and healthcare.

Example

Taxable Amount ($)	Proportional Tax (%)	Progressive Tax (%)	Regressive Tax (%)	Digressive Tax (%)
10,000	14	10	20	10
20,000	14	15	18	12
30,000	14	20	16	14
40,000	14	25	12	16
50,000	14	30	10	16
>50,000	14	35	9	16

From the above example, it can be seen that under the progressive tax system, the tax liability increases with income. If we take an example of a person earning $70,000 per annum, then his/her tax liability will be computed as follows under the progressive tax system:

- The first $10,000 at 10% = $1,000
- The second $10,000 at 15% = $1,500
- The third $10,000 at 20% = $2,000
- The forth $10,000 at 25% = $2,500
- The fifth $10,000 at 30% = $3,000
- The excess of $20,000 at 35% = $7,000
- The total tax liability will be $(1,000+1,500+2,000+2,500+3,000+7,000) = $17,000

Note: Any amount in excess of $50,000 is taxed at a flat rate of 35%.

Among the tax rate systems used to calculate the taxable liability of an individual or a corporation, the progressive tax rate is considered by many to be the best since it puts more burden on those with the highest purchasing power. Under this system, the average tax rate is less than the marginal tax rate. It can be explained further by referring to the same example:

The total tax liability is $17,000 on a taxable income of $70,000. This implies that the average tax rate will be $(17,000/70,000) = 24.3%. From the calculations, it is evident that the average tax rate of 24.3% is less than the marginal rate of 35%.

Remember the progressive tax system aims to get more money from those with higher purchasing ability. The government also uses other progressive measures to try and reduce income inequality as much as possible. Some of the progressive measures the government can put in place include imposing a property tax or even taxing luxury commodities heavily while exempting essential products from taxation.

The Economists' View on Progressive Tax Rates

The economy of a country is developed through investments. Most of the time, the remainder of income after consumption is what is invested. In an efficient economy, savings are supposed to equal investments. What this means is that after a person consumes part of their income, rather than keeping the balance in an unproductive state, it can be put in an income-generating activity.

The case might not be exactly like this in a progressive tax system since those with more are taxed heavier. **It leaves them with less disposable income** and they might also not have the morale to optimize their productivity since the marginal income is taxed at an extremely high marginal rate. This may lead to a reduced level of investment, which can have a detrimental effect on the overall economy in the long term.

From the point of view of those who benefit from progressive taxes, their purchasing power becomes stronger. Also, the demand for certain commodities that are either subsidized or are part of the basic commodities increases. These two factors can promote growth and development in areas that may have otherwise been difficult to stimulate.

The effect of a progressive tax on economic growth can have two interpretations, depending on your school of thought. Classical economists believe that economic growth should take a natural course without government intervention while the Keynesians believe in government expenditures to stimulate economic growth.

Impact of Inflation on a Progressive Tax System

Inflation is a state where the price levels of goods and services keep on increasing without a corresponding positive change in standards of living. It reduces the purchasing power of money and also the value of investments. Thus, during inflation, those affected by progressive tax rates pay higher than the proper value initially set for them.

Summary

Taxation is the source of government revenue. On the other hand, citizens look at it as a burden on them and some do all that they can to evade or avoid paying taxes. The conditions can be aggravated by some tax systems and rates, such as the progressive tax system that seems to punish hard work. For example, you can get a person earning $10,000 paying 10% of his or her earnings while another person earning $70,000 is required to pay 30% of his/her income as tax. This can be seen as a great injustice to the hard-working citizens and a big demoralizer.

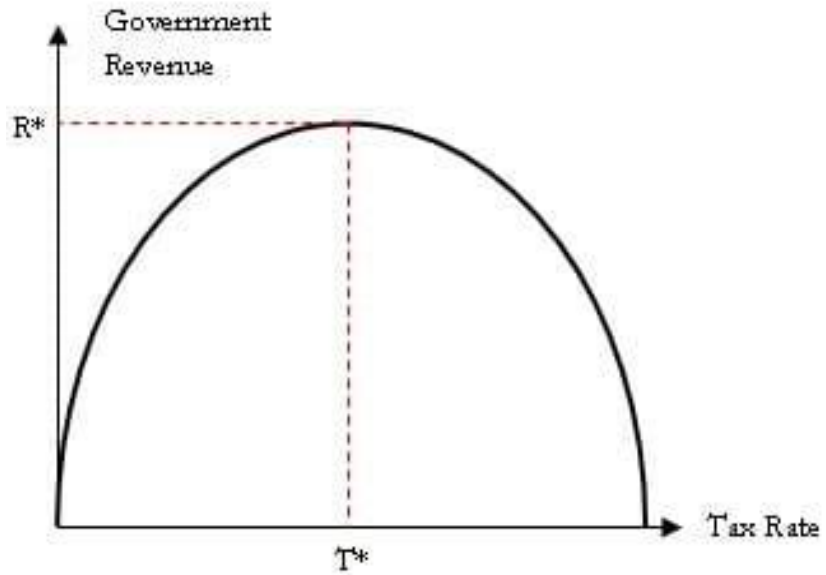
Privileges due to their different character are able to cover significant quantity of taxes payers, which leads to a great decreasing of real rate of taxation in comparison with nominal.

Laffer Curve

The Laffer Curve is a theoretical explanation of the relationship between the tax rates set by the government and the tax revenue collected at that tax rate. It was introduced by American supply-side economist, Arthur Laffer. The concept was not invented by Laffer; there were other antecedents from the 14th-century writings of Ibn Khaldun.

The Laffer Curve says that there is no tax revenue collection at the two extreme tax rates of 0% and 100%. However, there is one optimal tax rate between both these extremes that maximizes tax revenue collection. One of the theory's main assumptions is that if taxation on a certain activity, such as production, is increased beyond a certain point, less of it is produced. Beyond the optimal tax rate, workers start to believe that their extra efforts are resulting in lower additional income. Thus, they work less, income falls, and tax collection decreases.

Workings of the Laffer Curve



Graph 7.1 Luffer's curve

We plot the tax rate on the horizontal axis and the government revenue from taxation on the vertical axis. The curve assumes a parabolic shape. It suggests that at the initial point, the origin when the tax rate is 0%, there is no revenue for the government. As the government increases the tax rate, the revenue also increases until T*. Beyond point T*, if the tax rate is increased, revenue starts to fall. In short, attempts to tax above a certain level are counterproductive and actually result in less total tax revenue.

The taxpayers' incentive to work more for more income starts falling and they prefer to work less because of the feeling that their money is being taken away by the government. At the tax rate of 100%, the tax base of the country will be nil and nobody would work because they will need to give away all their earnings as taxes. T* is the optimal tax rate that a government should aim to achieve.

Significance of the Laffer Curve

Laffer brought this concept to the attention of policymakers in 1974 when the general approach of most economists was a Keynesian one. They advocated more government spending to stimulate demand, which in turn meant more taxes. This policy was going downhill and Laffer asserted that this problem was not because of too little demand but due to the burden of heavy taxes and regulations that left producers without incentive to produce more.

Tax rate cuts affect revenues in two ways. Every tax rate cut translates directly to less government revenue but in the longer term, puts more money in the hands of taxpayers, increasing their disposable income. Hence, business activity increases, companies hire more, who in turn spend more, and this leads to economic growth. The growth creates a larger tax base and generates higher total tax revenue in the long term.

A higher tax rate increases the burden on taxpayers. In the short term, it may increase revenues by a small amount but carries a larger effect in the long term. It reduces the disposable income of taxpayers, which in turn, reduces their consumption expenditure. Aggregate demand in the economy falls and producers create less. This leads to higher unemployment. The tax base for the government falls and so does its tax revenue.

2. Multipliers of fiscal policy

Tax multiplier (m_T)

$$\mathbf{m_T = -c' / 1-c'}$$

Where c' - is marginal consumption propensity

Tax multiplier shows that taxes increasing to some part decreases manufacture volume to bigger part.

Aggregate effect from taxes increasing are determined by such formula:

$$\mathbf{\Delta Y = m_T \cdot \Delta T}$$

Where ΔY – change of income;

ΔT – change of tax receipts.

Multiplier of the government spending (M_G)

$$\mathbf{m_G = 1' / (1-c') \cdot (1-t)}$$

Where t - is the part of taxes in aggregate incomes.

Multiplier of the government spending reflects how a change of state costs can change aggregate incomes.

General effect from the change of costs is determined by the formula:

$$\Delta Y = m_G \cdot \Delta G$$

Where ΔY - is a change of income;

ΔG - is a change of state costs.

3. Automatic stabilizations and discretional stabilizing policy

Automatic stabilizations are such mechanisms in economy action of which decreases GNP reaction on changes of aggregate demand.

- Automatic change of tax receipts.

Tax system progressively depends on personal incomes and enterprises incomes. If manufacture volume decreases then tax receipts decrease in the way that the fall of personal incomes and charges become weaker.

During inflation periods increasing of tax receipts decreases personal incomes, holds consumption costs, reduces aggregate demand and slows down price and wage increasing

- Unemployment help, social help and other transferts.

Unemployment help pours in capital in economy (during crises) or withdraws it (during boom) and, as a result, stabilizes and make smoother consequences of business cycles.

It's the same to other transferts.

Discretional fiscal policy

The main means of discretional fiscal policy.

- Change of social works program and other programs connected with costs.
- Change of "transferts types" programs.
- Cycle changes of tax rates level.

Discretional fiscal policy is a policy, when the government consciously manipulates the taxes and state charges to change real volume of national manufacture and employment, to control inflation and accelerate economical growth.

4. State budget and budget restriction.

Budget (B) is money expression of balanced estimation of incomes and charges during some period.

Actual budget (B_A) reflects real charges, receipt and deficiency during some period.

Structure budget (B_S) reflects what the state charges should be, receipt and deficiency if economy is functioning having potential volume of manufacture (is

determined by the action of discretional programs, which were established legislatively).

Cycle budget (B_C) shows an influence of business cycle on budget and measures charges changes receipt and deficiency, which appears because economy isn't working having potential volume of manufacture, but is in state of rise or recession (it's determined by the action of automatic stabilizers). Cycle budget is the difference between actual and structure budgets.

$$\mathbf{B_C = B_A - B_S}$$

State budget

The balance of incomes and charges of the state

- Incomes:
  - ❖ Income tax of the corporations.
  - ❖ Trade tax.
  - ❖ Local taxes.
  - ❖ Incomes from externally economical activity.
  - ❖ Rent payments.
  - ❖ Untaxed incomes.
  - ❖ Income tax.
  - ❖ Other.
- Charges:
  - ❖ Financing of the economy.
  - ❖ Socially-cultural programs and ST programs.
  - ❖ Defense.
  - ❖ Management.
  - ❖ Goal programs.
  - ❖ Credits and help to other countries.

Payments from state budget

Assignment is the edition money from state budget to hold enterprises and establishments.

Grants are type of state money help which is given to organizations, establishment and population.

Subventions are type of state money help to local authorities or separate branch economic authorities for development.

Grants are type of state money help which is given to organizations, establishments to help them to cover losses.

State budget condition

Normal, when given part of state budget equals to income.

Scarce, when charges exceed incomes.

Scarce of the state budget isn't dangerous to economy in general if it's on 2-3% level of GNP. Otherwise it reflects negatively on functioning of money and credit system and all economy in general.

Types of budget scarce

- **Cycle scarce** is the scarce which is the result of cycle fall of manufacture (reduction of national income and manufacture volume) in a consequence of conjuncture fluctuations.
- **Structure scarce** is the scarce which is the result of discretion policy (establishment of tax rates, social maintenance payments, size of defense charges).

The main factors of state budget scarce growth

1. Increasing of defense charges.
2. Increasing of state debt payments.
3. Increasing of transferts payments.
4. Decreasing of taxes.

State debt

State debt is accumulated sum of money, lent by the government for financing of scarce.

Increasing of state debt during some year equals to budget scarce.

Influence of state debt on economy.

- In short-term period the consequences of budget scarce are known as "replacement" problem.
- In long-term period "debt burden" is shifted on accumulation of capital and consumption of future generations.

In sort-term period replacement occurs when efficiency of fiscal policy in consequence of reaction of money market decrease. Increasing of structure scarce, because of taxes decreasing or increasing of government charges, can lead to increasing of interest rates and accordingly leads to decreasing of investments. That's why, maybe, GNP wouldn't increase and bigger structure scarce will replace investments.

Internal state debt means state debts to its citizens (who own internal state obligations).

External state debt means debts to citizens and organizations of other countries.

Economical consequences of state debt

1. Reduction of consumption of country population.
2. Replacement of private capital, which restricts further increasing of economy.
3. Taxes increasing is the instimulation of economical activity.
4. Redistribution of income on benefit of state obligations owners.

Shapter 8
Money-credit system

In this chapter we will explore:

1. Concept and types of the money systems. Monetary policy of the state.
2. Suggestion of money and factors, that it is determined. Deposit and money multiplications.
3. Suggestion of money and budget constraint.
4. Keynesians and monetarists conceptions of money policy.

1. Concept and types of the money systems. Monetary policy of the state.

The money system is a form of organization of money circulation, which historically and legislatively appeared in every country.

Money circulation is continuous motion of money, which execute the functions of mean of appeal and payment, and also serve the rotation of commodities and services.

The law of money circulation is determined by the amount of money, necessary day of appeal:

$$M = Cr+Ca+Pc+p / V$$

Where, M - amount of money, necessary for an appeal;
Cr - a sum of costs of commodities, that realization is subject;
Ca - a sum of costs of commodities which are sold on an account;
Pc - payments, the term of payment of which came;
p - payments which are paid;
V - velocity of circulation of one monetary item.

Basic elements of the money system:

- **a monetary item** - is a measure of money, accepted in a country for unit (the costs of commodities and services are expressed in it);
- **a scale of prices** - is a gravimetric amount of money metal, accepted in a country for a monetary item;
- **the emission system** - is establishments which carry out the issue of money and securities and determine the order of emission;
- **forms of money** - an exchange value which provides stability of appeal of commodities and is a stable circulating medium in available circulation materialization in the certain type of general equivalent;
- **institutes of the money system** - state and non state establishments which regulate money circulation;
- **a currency parity** - is correlation of national currency with other currencies.

Types of credit money:

- **a bill of exchange** - is a debt obligation of borrower a creditor about payment a debt in the appointed term;
- **a deposit money** - is the system of the special calculations between banks on the basis of bank orders from one account on other;
- **banknotes (circulating note)** - are money signs which are produced emission establishments;
- **cotter pins** - are an order of proprietor of account (drawer of a check) credit establishment which serves him, to pay the certain sum of money the holder of a check;
- **electronic money** - are the system of bank calculations by computer.

Modern money circulation shows by itself the aggregate of money facilities which come forward in 2-x forms: to available and cashless. On a volume cashs considerably yield to money facilities which are on accounts (banknotes and chinks in modern terms are approximately 10% all money facilities). A variety of money facilities which function in a modern economy generates the problem of measuring of amount of money.

Structure of amount of money

Amount of money - is an aggregate of all money facilities, which are in a national economy in available and to cashless forms and execute the functions of facilities of appeal, payment and accumulation.

Depending on the degree of liquidity of different forms of money select such indexes of amount of money:

- money is for operations (M_1)

M_1 = banknotes, billons chinks which apply out of banks + current check accounts (permanent and other check calculations)

- money is in the wide understanding (M_2)

$M_2 = M_1$+ well-kept and time deposits in commercial banks

- M_3

$M_3 = M_2$+ payments in the specialized establishments and the special types of piling up

- liquidity of assets (L_A)

$L_A = M_3$+ other liquid assets (short-term to the 3-x months state securities and others like that)

- deposits (D)

D = L+ bonds and other analogical credit instruments

Deposits - are payments of legal and physical entities in banks.

Under **liquidity of assets** understand possibility of their converting into a money form without the substantial loss of cost and in short space.

The money of high efficiency make basis of all of amount of money of country (banknotes, chinks and deposits of commercial banks, are in the Central bank) - they are yet named a monetary base (H). General size of monetary base of country in every this moment it is possible to define after the Central bank statement:

ASSET	PASSIVE VOICE
Currency backlogs (CB) (gold and foreign currency)	Cashes are in circulation (CC)
Securities (SP)	Deposits of commercial banks (DCB)
Credits of commercial banks (CCB)	Deposits of government (DG)
Credits of government (CG)	Other passive voices (OPV)
Other assets (OA)	

$$CB+SP+CCB+CG+OA = CC+DCB+DG+OPV$$

As mediums of exchange can be used only cashes in circulation (CC).

Deposits of commercial banks (DCB) are not a money, but serve as backlogs of the money system.

$$AM = CC+D$$

Where, AM - amount of money;
CC - cashes in circulation;
D - deposits.

$$H = CC+rb = MHE$$

Where, H - is a monetary base;
rb - minimum bank backlogs;
MHE - money of high efficiency.

With the purpose of prevention of bankruptcy commercial banks must have minimum stocks of available monies. In the modern two-tier banking system (Central bank - commercial banks) for commercial banks the norms of minimum backlogs (r) are set as obligatory interest-free payments to the Central bank. Their size is determined in percents from deposits in commercial banks.

2. Suggestion of money and factors, that it is determined. Deposit and money multiplications

The amount of money grows in a country, if:

- a monetary base grows (H);
- the norm of obligatory minimum banking reserves goes down (r);
- surplus backlogs of commercial banks diminish (B);
- part of cashs goes down in the lump sum of circulating mediums of population (d).

The size of monetary base and norm of obligatory minimum banking reserves is determined the policy of the Central bank and come forward the exogenous parameters of model of suggestion of money (M^S):

$$\mathbf{M^S = m_m(r, B(I), d(I))\cdot H}$$

Where, m_m - money multiplication.

Central bank and suggestion of money

Task of the Central bank:

- providing of stability of national currency;
- providing of pay appeal;
- an assistance state control is after private banks;
- providing of liquidity of commercial banks;
- providing of stability of the banking system on the whole.

Instruments of the Central bank

1. There is open-market operation:

- flexible currency - political instrument which appears at a sale or purchase the Central bank of securities at the "opened market" at commercial banks;
- used for the lead through of expansive (purchase) or restrictive (sale) of money policy.

2. Policy of registration rate:

- instrument of the direct adjusting of money-and-credit appeal;
- it appears in the changes of registration rate in accordance with the conjuncture vibrations of economy;
- used for a management credit activity.

3. Policy of minimum backlogs:

- most hard instrument of monetary accommodation;
- it appears in manipulation the norm of obligatory backlogs, what commercial banks are under an obligation to keep on accounts in the Central bank;
- used as a mean for a rapid compression or expansion of credit mass in the system.

Multipliers

All together commercial banks in the conditions of the two-tier banking system create a money, when give loans in the volume of the credit resources.

Credit resources of commercial bank (CRCB) = Deposits (D) are a sum of obligatory banking reserves ($\sum r$)

Possibility of creation of money is determined all banking system by a deposit multiplier.

A deposit multiplier (m_D) is inversely proportional the norm of minimum banking reserves (r):

$$m_D = 1 / r$$

He shows, in how many times commercial banks increase the size of amount of money in circulation.

Money suggestion (M^S) is related to the monetary base (H) thus:

$$\Delta M^S = m_D \cdot\cdot \Delta H$$

Where ΔM^S - is an increase of suggestion of money;

m_D - is a deposit multiplier;

ΔH - is an increase of monetary base.

A money multiplier (m_M) is the complicated variant deposit, the conduct of both banks and population is taken into account in which:

$$m_M = 1+d / r+d$$

Where m_M - is a money multiplier;

d - is attitude of cashes toward deposits in a population;

r - is a norm of obligatory banking reserves (attitude of backlogs is toward deposits).

Money multiplier (m_M) - it is determined as attitude of amount (M^S) of money toward a monetary base (H) (money of the Central bank).

A money multiplier (m_M) shows in how many times the volume of amount (M^S) of money will change in the case of change of money base (H).

Thus, the amount of money can be presented as work of monetary base and multiplier.

A money multiplier is used the institutes of the money system for macroeconomic prognostication of suggestion of money adjusting of amount of money.

3. Suggestion of money and budget constraint.

When the state budget is erected with a deficit, Treasury bonds, to get a money for payment of national debts.

The buyers of bonds of Treasury can be:

- Central bank;
- commercial banks;
- households;
- foreigners (both private and public, sector).

A purchase is named the Central bank of state debt obligations monetization of budgetary deficit.

Monetization of budgetary deficit results in inflation.

There are three methods of financing of budgetary deficit:

- by the increase of amount of money of high efficiency;

- by the increase of bonds of Treasury in a population;
- by an exchange of the Central bank loss.

Thus, for coverage of budgetary deficit the state can print a money, do loans or outlay the currency backlogs.

4. Keynesians and monetarists conceptions of money policy.

After keynesians and by monetarist's conceptions the central problem of money policy is manipulation money suggestion (M^S) with the purpose of influence on major macroeconomic parameters.

Determination of suggestion of money.

Keynesians conception:

- a money policy is less influential, than budgetary - tax;
- the change of suggestion of money can influence on the combined charges mediated through the change of rate of percent;
- there are certain limitations of influence of money suggestion on the pond of percent, and rates of percent are on the level of investments;
- vibrations of money suggestion changes the rate of percent, which determines the level of investing, I investments as element of the combined charges influence on the combined demand and equilibrium production volume.

Monetarist's conception:

- growth of amount of money results in growth of rates inflation;
- the change of money suggestion directly influences on the combined charges, because equalization of exchange embarks on basis:

$$\mathbf{M \cdot v = P \cdot\cdot Q;}$$

- manipulating the amount of money it is impossible to influence on the pond of percent;
- the main mean of revival of economy must be not stimulation, but structural changes of economy, expansion of production possibilities, growing money suggestion.

Shapter 9
Employment and social defence of population

In this chapter we will explore:

1. Employment as economic problem.
2. Unemployment: essence, kinds and consequences. The Ouken's Law.
3. Government control of market of labour force and state system of providing of employment.
4. Intercommunication of inflation and unemployment after classic and by keynesians theories. The Philips curve.

1. Employment as economic problem.

- *Employment as an economic category* is an aggregate of economic, legal, social, national relations, related to providing of capable of working population workers placed and his participating in publicly useful activity which brings a profit.
- *Employment as an economic problem* is a between's by the amount of capable of working population and by the amount of busy, which characterizes level of the use of labour resources of society and situation at the market of labour force.

Structure of capable of working population:

- *Engage in production* (Rl is busy);
- *Unemployed persons* (Up) - those which do not work, but shop around actively;
- *Voluntarily not workings* (H) - those which do not work and does not shop around at this level ettlings (to the category of unemployed persons does not belong).

General level of labour resources (Rl) consist of two groups of population: quantity engage in production (L) and unemployed persons (Up):

$$\mathbf{Rl = L + Up}$$

An actual unemployment (u) rate is calculated as part of the officially registered unemployed persons (Up) to the incurrence of people which can and wish to work (R):

$$\mathbf{u = \frac{Up}{R} \cdot 100\%}$$

In a market economy, by virtue of its dynamism, necessarily there is optimum reserve of labour force and supported natural norm of unemployment (u*), at which an of long duration equilibrium is arrived at at terms, when an inflation rate equals the expected rate of price advance.

First the concepts of norm of natural unemployment in an economic theory entered independent of each other M.Fridmen and E.Felps in 1968 year.

The natural norm of unemployment (u*) characterizes better for an economy reserve of labour force, able quickly to carry out the sectorial and regional moving depending on demand on labour force and necessities of production.

Basic factors which influence on the norm of unemployment:

1. Growth of time is on the search of work in the conditions of the system of insurance on unemployment:

a) payment of help in case of unemployment lowers stimuli to rapid employment;

b) the increase of size of help in case of unemployment and term of its payments is instrumental in the increase of unemployment rate.

1. Firmness of ettlings is generated by „unemployment of expectation" („unemployment of expectation" arises up in periods of growth of the real wage and exceeding of its level above a equilibrium value).

2. A difference is in the rates of growth on the sectors of economy.

3. The dynamics of actual unemployment substantially influences on the norm of natural unemployment.

4. Dynamics of minimum wage. The low level of minimum wage increases the terms of search of work, as those, who shops around first, and also and those, who searches more high-paying work.

5. Effect hysteresis. If an unemployment rate rises and long time reposes on a high level under the action of exogenous factors, he can not go back to an initial value after stopping of their action which results in growth of norm of natural unemployment.

For determination the norms of natural unemployment use the average of actual unemployment in a long-term period.

Full employment means the complete use of all suitable labour resources.

In the conditions of full employment actual unemployment equals natural unemployment.

2. Unemployment: essence, kinds and consequences. The Ouken's law

Unemployment in a market economy is a market of labour force condition at terms, when suggestion of labour force exceeds demand on it.

Basic types of unemployment

- Friction unemployment is temporal unemployment which is related to the voluntarily or forced search or expectation of work.
- Structural unemployment is freeing of labour force under act of structural changes in an economy, which change demand on separate professions and professions and suggestion of market of labour force in relation to them.
- Cyclic unemployment is freeing of labour force, caused a general downstream, that by the that phase of economic cycle, which is related to the crisis phenomena in an economy, reduction of the combined demand, proper reduction of employment and growth of unemployment.
- Institutsional unemployment is a type of unemployment, related to functioning of instruments of market of labour force and factors which influence on demand and supply on him (incomplete inflation about vacancies, overpriced level of help on unemployment, abated tax on profits etc).

The Ouken's law

When it comes to studying the economy, growth and jobs are two primary factors economists must consider. There is a clear relationship between the two and many economists have framed the discussion by trying to study the relationship between economic growth and unemployment levels. Economist Arthur Okun first started tackling the discussion in the 1960s and his research on the subject has since become known as Okun's law. Below is a more detailed overview of Okun's law, why it is important and how it stood the test of time since first being published.

Okun's Law: The Basics

In its most basic form, Okun's law investigates the statistical relationship between a country's unemployment rate and the growth rate of its economy. The economics research arm of the Federal Reserve Bank of St. Louis explains that Okun's law "is intended to tell us how much of a country's gross domestic product (GDP) may be lost when the unemployment rate is above its natural rate." It goes on to explain that "the logic behind Okun's law is simple. Output depends on the amount of labor used in the production process, so there is a positive relationship between output and employment. Total employment equals the labor force minus the unemployed, so there is a negative relationship between output and unemployment (conditional on the labor force)."

Yale professor and economist, Arthur Okun, was born in November 1928 and died in March 1980 at the age of 51. He first published his findings on the subject in the early 1960s, which have since come to be known as his "law." Okun's law is, in essence, a rule of thumb to explain and analyze the relationship between jobs and growth. A talk from former Federal Reserve Chairman, Ben Bernanke, perhaps most succinctly summarizes Okun's law basic concepts:

"That rule of thumb describes the observed relationship between changes in the unemployment rate and the growth rate of real gross domestic product (GDP). Okun noted that, because of ongoing increases in the size of the labor force and in the level of productivity, real GDP growth close to the rate of growth of its potential is normally required, just to hold the unemployment rate steady. To reduce the unemployment rate, therefore, the economy must grow at a pace above its potential.

More specifically, according to [the] currently accepted versions of Okun's law, to achieve a one percentage point decline in the unemployment rate in the course of a year, real GDP must grow approximately 2 percentage points faster than the rate of growth of potential GDP over that period. So, for illustration, if the potential rate of GDP growth is 2%, Okun's law says that GDP must grow at about a 4% rate for one year to achieve a one percentage point reduction in the rate of unemployment."

The conjuncture vibrations of economy influence on an actual unemployment rate.

The Ouken's law: in a situation, when an actual unemployment rate exceeds natural on 1%, lag of actual GNP under his potential volume is 2,5%.

$$\mathbf{UR} = \frac{QUP}{QWP} \cdot 100\%$$

The Ouken's law of consists of the 3-x stages:

1. Determination of percent of lag of actual unemployment rate is from natural:

$$\mathbf{PL = (AUR - NUR) \cdot 2{,}5}$$

On every percent of exceeding of actual unemployment rate above his natural level of loss are 2.5%.

2. Potential GDP.

$$\boldsymbol{GDP_p} = \frac{GDPa \cdot 100}{100 - PL}$$

Determination of losses is from cyclic unemployment.

$$\mathbf{Lc = GDP_P - GDP_A}$$

Economic and social consequences of conjuncture unemployment

- In accordance with the Ouken's law, there is lag of actual volume of VNP by comparison to a volume, which society could attain full employment at terms.
- There is uneven allocation of charges from unemployment among the different social layers of population. неравномерный
- During conjuncture unemployment - through the protracted periods of inactivity - qualification of workers, which can afterwards stipulate a considerable wage-cut or new liberations, is lost.
- Unemployment results in worsening of bodily and psychological condition of workers, the level of their diseases rises and others like that.
- Unemployment results in public and political disorder.

3. Government control of market of labour force

After the keynesians theory of employment, in the conditions of market economy there is not a mechanism which provides and guarantees full employment.

One of conclusions of this theory there is fundamental position that the market system can not be considered, which regulates and needs systematic and purposeful government control.

Government control of market of labour force is carried out after three basic principles:

- Employment of unemployment population and grant of help is in relation to preparation and retraining of shots (labour exchanges).

- The social protecting of victims is from unemployment of people (system of helps).
- Stimulation of forming of flexible labour-market. Legal providing of labour relations.

Methods of the state providing of employment:

1. Direct methods:

a) legislative adjusting of terms of renting and use of labour force (labour legislation);

b) stimulation of creation of new workplaces and suggestion of labour force;

c) measures are on a maintainance and increase of level of employment on enterprises.

2. Not direct methods:

a) public financial policy (assignation and subsidies);

b) monetary policy (adjusting of money circulation);

c) fiscal policy (change of tax rates);

d) payments of different types of helps are in case of unemployment.

4. Intercommunication of inflation and unemployment after classic and by keynesians theories. The Fillips curve.

Going near the problems of inflation and unemployment in keynesians and to monetarism theories

	Keynesians	Monetarism
Purpose of economic policy	Achievement of full employment is at stable prices and payment.	A fight is against inflation - reason of unemployment.
Facilities of achievement of the put purpose	1. Growth of money circulation (method of increase of employment and production). 2. flexible money policy (an instrument of providing is without a crisis market). 3. financing deficit of economy (mean of stimulation of demand, growth of social guarantees).	1. Severely controlled growth of money circulation. 2. hard money and stable fiscal policy. 3. budgetary equilibrium. The deficit of budget conduces to growth of state interference with a market mechanism.
Reason of economic stability	Policy of trade unions which require the increase of ettlings.	Flexible money policy which does not answer the market mechanism of adjusting of economy.

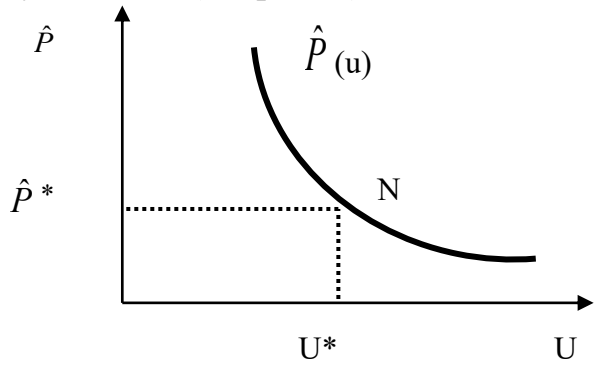
The Fillips curve

The Phillips curve is an economic concept developed by A.W. Phillips stating that inflation and unemployment have a stable and inverse relationship. The theory claims that with economic growth comes inflation, which in turn should lead to more jobs and less unemployment. However, the original concept has been somewhat disproven empirically due to the occurrence of stagflation in the 1970s, when there were high levels of both inflation and unemployment.

KEY TAKE A WAYS

- The Phillips curve states that inflation and unemployment have an inverse relationship. Higher inflation is associated with lower unemployment and vice versa.
- The Phillips curve was a concept used to guide macroeconomic policy in the 20th century, but was called into question by the stagflation of the 1970's.
- Understanding the Phillips curve in light of consumer and worker expectations, shows that the relationship between inflation and unemployment may not hold in the long run, or even potentially in the short run.

Keynesian did not explain reasons of simultaneous existence of inflation and unemployment, and this blank liquidated, australian economist A.W. Fillips, defining universal character of reverse dependence between the changes of ettlings: by an unemployment rate (Graph 9.1).



Graph 9.1 The Fillips curve.

The Fillips curve shows that at growth of demand on labour force and, accordingly, reduction of unemployment (u) rate standard of prices (P) and, accordingly, level of Inflation ($\hat{P}$) rises. Thus, the Fillips curve is the simplified one factor model of inflation (P), which determines it as a function of unemployment (u).

The Fillips curve segment on the left of point of N characterizes inflation having a drink, which can arise up as a result of attempts of the state to set high employment artificially.

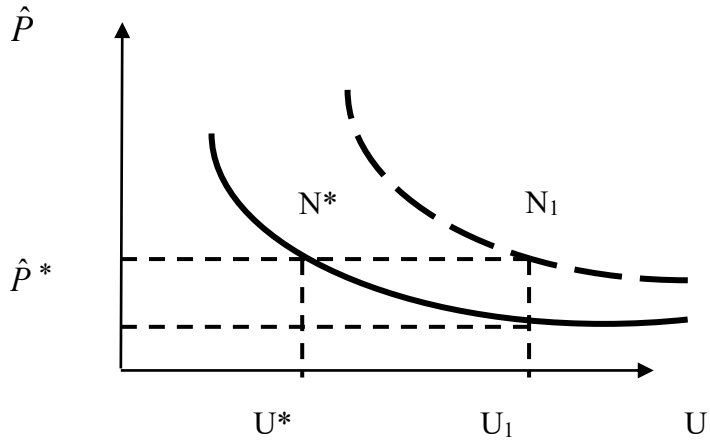
Segment business from the point of N represents a price decline in a period the crisis of overproduce.

The Fillips curve for certain represents the short-term dynamics of inflation and unemployment only, which is measured current indexes.

At existence of economic intercommunications, expressed the Fillips curve, it is impossible to attain full employment without inflation.

Stagflation is a period during which the slump of economic activity (stagnation) is accompanied inflation.

Graphically stagflation can be represented by the change of Fillips curve (u) to the right upwards (Graph 9.2).



Graph 9.2 The Fillips curve is in the conditions of stagflation

Understanding the Phillips Curve

The concept behind the Phillips curve states the change in unemployment within an economy has a predictable effect on price inflation. The inverse relationship between unemployment and inflation is depicted as a downward sloping, concave curve, with inflation on the Y-axis and unemployment on the X-axis. Increasing inflation decreases unemployment, and vice versa. Alternatively, a focus on decreasing unemployment also increases inflation, and vice versa.

The belief in the 1960s was that any fiscal stimulus would increase aggregate demand and initiate the following effects. Labor demand increases, the pool of unemployed workers subsequently decreases and companies increase wages to compete and attract a smaller talent pool. The corporate cost of wages increases and companies pass along those costs to consumers in the form of price increases.

This belief system caused many governments to adopt a "stop-go" strategy where a target rate of inflation was established, and fiscal and monetary policies were used to expand or contract the economy to achieve the target rate. However, the stable trade-off between inflation and unemployment broke down in the 1970s with the rise of stagflation, calling into question the validity of the Phillips curve.

The Phillips Curve and Stagflation

Stagflation occurs when an economy experiences stagnant economic growth, high unemployment and high price inflation. This scenario, of course, directly contradicts the theory behind the Philips curve. The United States never experienced stagflation until the 1970s, when rising unemployment did not coincide with declining inflation. Between 1973 and 1975, the U.S. economy posted six consecutive quarters of declining GDP and at the same time tripled its inflation.

Expectations and the Long Run Phillips Curve

The phenomenon of stagflation and the break down in the Phillips curve led economists to look more deeply at the role of expectations in the relationship between unemployment and inflation. Because workers and consumers can adapt their expectations about future inflation rates based on current rates of inflation and

unemployment, the inverse relationship between inflation and unemployment could only hold over the short run.

When the central bank increases inflation in order to push unemployment lower, it may cause an initial shift along the short run Phillips curve, but as worker and consumer expectations about inflation adapt to the new environment, in the long run the the Phillips curve itself can shift outward. This is especially thought to be the case around the natural rate of unemployment or NAIRU (Non Accelerating Inflation Rate of Unemployment), which essentially represents the normal rate of frictional and institutional unemployment in the economy. So in the long run, if expectations can adapt to changes in inflation rates then the long run Phillips curve resembles and vertical line at the NAIRU; monetary policy simply raises or lowers the inflation rate after market expectations have worked them selves out.

In the period of stagflation, workers and consumers may even begin to rationally expect inflation rates to increase as soon as they become aware that the monetary authority plans to embark on expansionary monetary policy. This can cause an outward shift in the short run Phillips curve even before the expansionary monetary policy has been carried out, so that even in the short run the policy has little effect on lowering unemployment, and in effect the short run Phillips curve also becomes a vertical line at the NAIRU.

Shapter 10
Theories of Growth

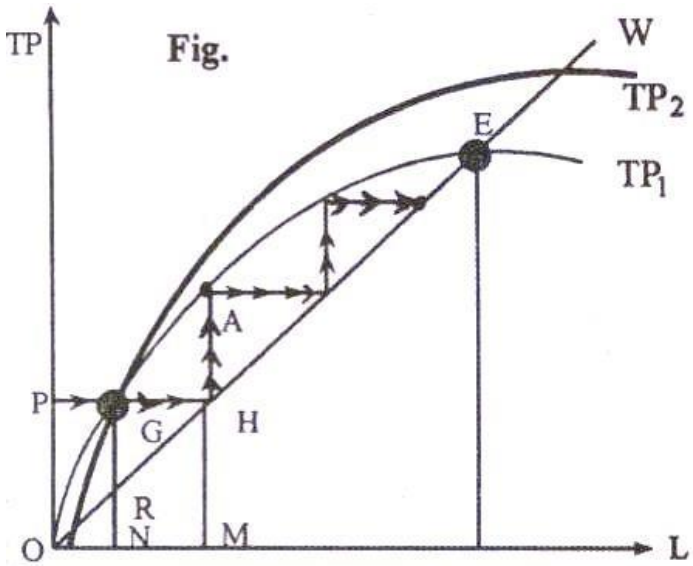
In this chapter we will explore:
1. Theories of Growth
2. The Solow Growth Model

1. Theories of Growth

1. Classical Growth Theory

The Classical Growth Theory postulates that a country's economic growth will decrease with an increasing population and limited resources. Such a postulation is an implication of the belief of classical growth theory economists who think that a temporary increase in real GDP per person inevitably leads to a population explosion, which would limit a nation's resources, consequently lowering real GDP. As a result, the country's economic growth will start to slow.

Structural Model



In the chart above, the y-axis represents total production, and the x-axis represents labor. Curve OW outlines the total subsistence wages. If the level of population is ON, and the level of output is OP, the per capita wage is represented by NR. Consequently, the surplus or profit is RG.

Because of the surplus, the capital formation process comes into effect. Consequently, the demand for labor increases, leading to a rise in total wages, as the curve moves to GH. If the total population remains constant at ON, and wages exceed subsistence wages, i.e., NG > NR, then total population and total manpower will increase as the curve moves toward OM. Because of the increase in population, surplus can be generated.

In such a manner, the process will continue until the economy reaches point E, as depicted by the arrow. Point E represents a stationary situation wherein wages and total output equalize, and no surplus can be generated. However, according to

classical economists, with technological progress the production function will shift upward, as depicted by the curve TP2. Also, according to the Classical Growth Theory, economic stagnation can be postponed, although ultimately not avoided.

Limitations of the Classical Growth Model

- **Ignorance with respect to technology**: The classical model of growth ignores the role efficient technical progress could play for the smooth running of an economy. Advancements in technology can minimize diminishing returns.
- **Inaccurate determination of total wages**: The classical model of growth assumes that total wages do not exceed or fall below the subsistence level. However, this is not entirely true. Changes in the industrial structure and substantial economic development can result in total wages exceeding or falling below the subsistence level. Moreover, the classical theory of growth does not consider the role played by trade unions in the process of wage determination.

2. Neoclassical Growth Model

The Neoclassical Growth Theory is an economic model of growth that outlines how a steady economic growth rate results when three economic forces come into play: labor, capital, and technology. The simplest and most popular version of the Neoclassical Growth Model is the Solow-Swan Growth Model.

The theory postulates that short-term economic equilibrium is a result of varying amounts of labor and capital that play a vital role in the production process. The theory argues that technological change significantly influences the overall functioning of an economy. Neoclassical growth theory outlines the three factors necessary for a growing economy. However, the theory puts emphasis on its claim that temporary, or short-term equilibrium, is different from long-term equilibrium and does not require any of the three factors.

Production Function in the Neoclassical Growth Model

The Neoclassical Growth Model claims that capital accumulation in an economy, and how people make use of it, is important for determining economic growth.

It further claims that the relationship between capital and labor in an economy determines its total output. Finally, the theory states that technology augments labor productivity, increasing the total output through increased efficiency of labor. Therefore, the production function of the neoclassical growth model is used to measure the economic growth and equilibrium of an economy. The general production function in the neoclassical growth model takes the following form:

$$Y = AF\,(K, L)$$

Where:

- **Y** – Income, or the economy's Gross Domestic Product (GDP)
- **K** – Capital
- **L** – Amount of unskilled labor in the economy

- **A** – Determinant level of technology

Also, because of the dynamic relationship between labor and technology, an economy's production function is often re-stated as Y = F (K, AL). This states that technology is labor augmenting and that workers' productivity depends on the level of technology.

Assumptions of the Neoclassical Growth Model

- **Capital subject to diminishing returns**: An important assumption of the neoclassical growth model is that capital (K) is subject to diminishing returns provided the economy is a closed economy.
- **Impact on total output**: Provided that labor is fixed or constant, the impact on the total output of the last unit of the capital accumulated will always be less than the one before.
- **Steady state of the economy**: In the short term, the rate of growth slows down as diminishing returns take effect, and the economy converts into a "steady-state" economy, where the economy is steady, or in other words, in a relatively constant state.

Key Conclusions of the Neoclassical Model of Growth

- **Output as a function of growth**: The neoclassical growth model explicates that total output is a function of economic growth in factor inputs, capital, labor, and technological progress.
- **Growth rate of output in a steady-state equilibrium**: The growth rate of total output in a steady-state equilibrium is equal to the growth rate of the population or labor force and is never influenced by the rate of savings.
- **Increased steady-state per capita income level**: While the rate of savings does not influence the steady-state economy growth rate of total output, it does result in an increase in the steady-state level of per capita income and, therefore, total income as well, as it raises the total capital per head.
- **Long-term growth rate**: The long-term growth rate of an economy is solely determined by technological progress or regress.

3. Endogenous Growth Theory

The Endogenous Growth Theory states that economic growth is generated internally in the economy, i.e., through endogenous forces, and not through exogenous ones. The theory contrasts with the neoclassical growth model, which claims that external factors such as technological progress, etc. are the main sources of economic growth.

Key Policy Implications of Endogenous Growth Theory

- Governmental policies can raise an economy's growth rate if the policies are directed toward enforcing more market competition and helping stimulate innovation in products and processes.
- There are increasing returns to scale from capital investment in the "knowledge industries" of education, health, and telecommunications.

- Private sector investment in R&D is a vital source of technological progress for the economy.

2. Solow Growth Model

The Solow Growth Model is an exogenous model of economic growth that analyzes changes in the level of output in an economy over time as a result of changes in the population growth rate, the savings rate, and the rate of technological progress.

The Solow Growth Model, developed by Nobel Prize-winning economist Robert Solow, was the first neoclassical growth model and was built upon the Keynesian Harrod-Domar model. The Solow model is the basis for the modern theory of economic growth.

Simplified Representation of the Solow Growth Model

Below is a simplified representation of the Solow Model.

Assumptions:

1. The population grows at a constant rate g. Therefore, current population (represented by N) and future population (represented by N') are linked through the population growth equation N' = N(1+g). If the current population is 100 and the growth rate of population is 2%, the future population is 102.

2. All consumers in the economy save a constant proportion, 's', of their incomes and consume the rest. Therefore, consumption (represented by C) and output (represented by Y) are linked through the consumption equation C= (1+s)Y. If a consumer earns 100 units of output as income and the savings rate is 40%, then the consumer consumes 60 units and saves 40 units.

3. All firms in the economy produce output using the same production technology that takes in capital and labor as inputs. Therefore, the level of output (represented by Y), the level of capital (represented by K), and the level of labor (represented by L) are all linked through the production function equation Y = aF(K,L).

The Solow Growth Model assumes that the production function exhibits constant-returns-to-scale (CRS). Under such an assumption, if we double the level of capital stock and double the level of labor, we exactly double the level of output. As a result, much of the mathematical analysis of the Solow model focuses on output per worker and capital per worker instead of aggregate output and aggregate capital stock.

4. Present capital stock (represented by K), future capital stock (represented by K'), the rate of capital depreciation (represented by d), and level of capital investment (represented by I) are linked through the capital accumulation equation K'= K(1-d) + I.

Solving the Solow Growth Model

1. In our analysis, we assume that the production function takes the following form: $Y = aK^bL^{1-b}$ where $0 < b < 1$. The production function is known as the Cobb-Douglas Production function, which is the most widely used neoclassical production function. Together with the assumption that firms are competitive, i.e., they are price-taking firms, the coefficient b is the capital share (the share of income that capital receives).

2. Therefore, output per worker is given through the following equation: $y = ak^b$ where $y = Y/L$ (output per worker and $k = K/L$ (capital stock per worker)

3. Under the assumption of competitive equilibrium, we get the following:

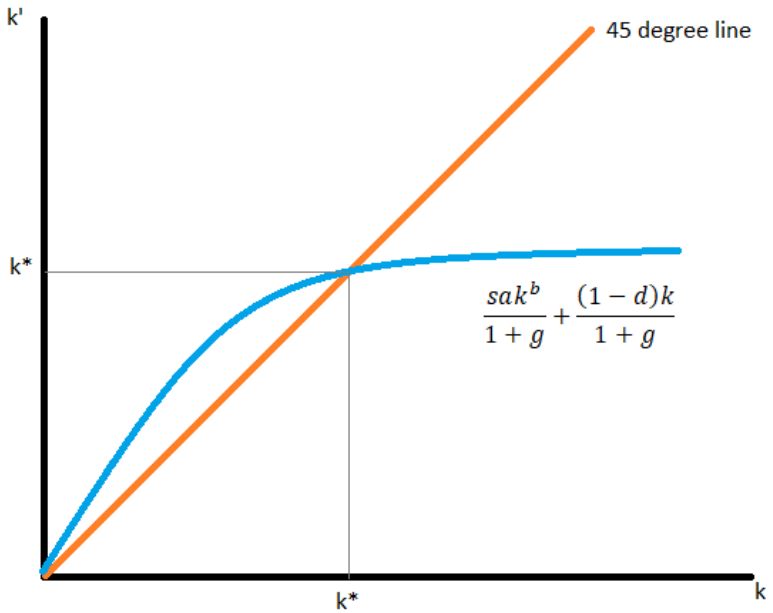
- The income-expenditure identity holds as an equilibrium condition:

$$Y = C + I$$

- Consumer's budget constraint: $Y = C + S$
- Therefore, in equilibrium: $I = S = sY$.
- The capital accumulation equation becomes: $K' = (1–d)K + sY$

4. The capital accumulation equation in per worker times is given through the following equation: $(1 + g)k' = (1 – d)k + sy = (1 – d)k + saf(k) = (1 – d)k + sak^b$

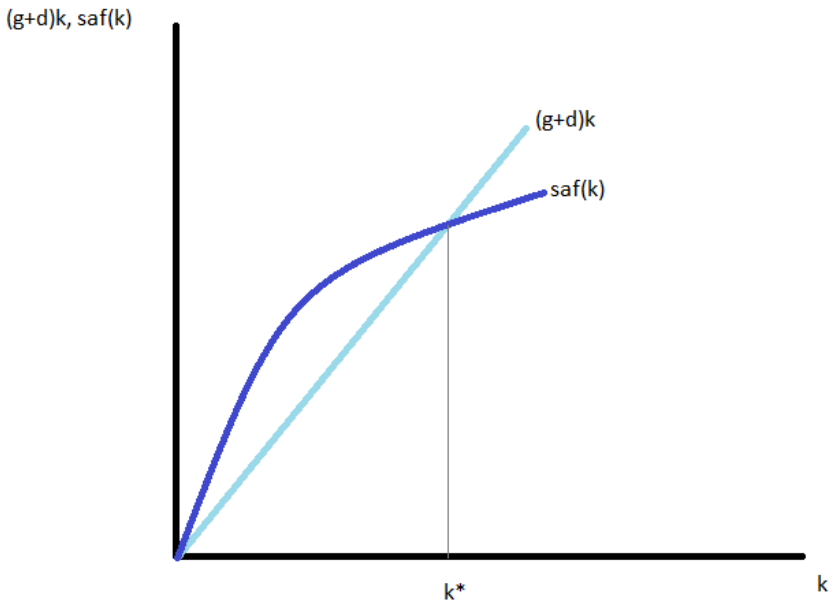
5. The solution concept used is that of a steady state. The steady state is a state where the level of capital per worker does not change. Consider the graph below:



6. The steady state is found by solving the following equation: $k' = k \Rightarrow (1 + g)k = (1 – d)k + sak^b$

7. Therefore, the steady state value of capital per worker and the steady state value of output per worker are the following:

$$k^* = \left(\frac{sa}{g+d}\right)^{\frac{1}{1-b}}$$



Implications of the Solow Growth Model

There is no growth in the long term. If countries have the same g (population growth rate), s (savings rate), and d (capital depreciation rate), then they have the same steady state, so they will converge, i.e., the Solow Growth Model predicts conditional convergence. Along this convergence path, a poorer country grows faster.

Countries with different saving rates have different steady states, and they will not converge, i.e. the Solow Growth Model does not predict absolute convergence. When saving rates are different, growth is not always higher in a country with lower initial capital stock.

Shapter 11
Macroeconomic policy in open economy

In this chapter we will explore:

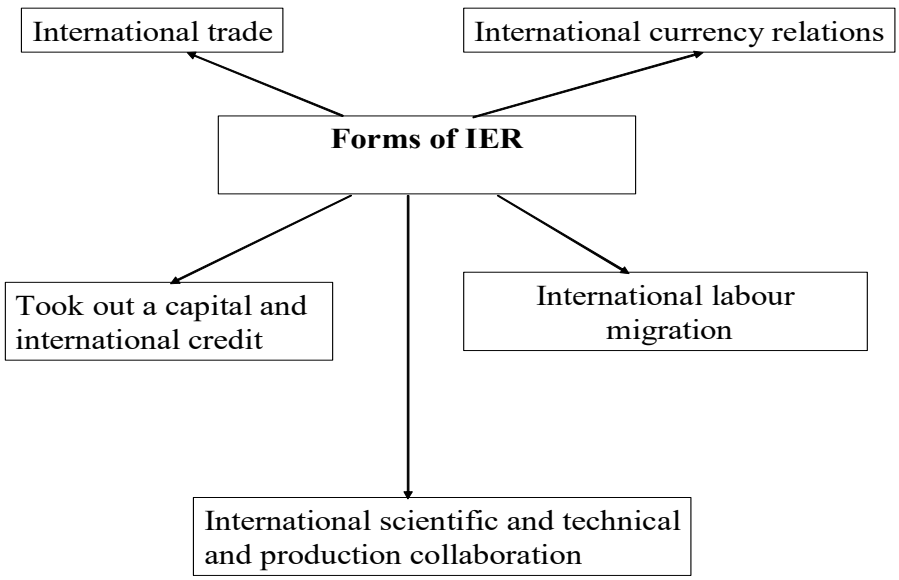
1. World economy and national economy. Forms of international economic relations.
2. Took out a capital as a leading form of international economic relations.
3. International trade: role, volume, structure and features. Balance of payments. Auction deficit.

1. World economy and national economy. Forms of international economic relations.

A world economy is the diversifyed global economy, which binds national economies in the unique system the exchange of economic activity, international division of labour (IDL).

Forms of international economic relations

International economic relations (IER) exist in such forms:



One of important tendencies of forming and development of world economy is growth of processes of internationalization. Basis of this process is made by internationalization of production and capital.

Internationalization of production

Reasons of strengthening of international factor are in a reproductive process:

1. Going of reproductive process is beyond national scopes and expansions of capacity of market optimum size of which no less 250-300 million persons.
2. Narrow-mindedness of resources of separate countries is for the independent conducting of fundamental researches.

3. A necessity of including of all factors of production of the national states is for world motion and international division of labor.

4. Growing exchange by ready-to-cook foods, details, knots, within the framework of international specialization and co-operation of production.

Forms of internationalization of production:

1. Integration is an association at first of markets, and afterwards productions, two held in a free trade and enterprise zone.

2. Transnational is a process of interlacing of economies of the different states due to that enterprises build and buy corporations in other countries, found in them the branches which work on MNC within the framework of specialization and co-operation. Переплетение экономик

Functions of MNC (multinational corporation):

- disposes of daughter's companies in two or a few countries, regardless of legal form and sphere of activity of these companies;
- has such system of making decision, which allows to carry out the concerted policy and general strategy from one or a few centers;
- it daughter's companies are so linked between itself through the relations of ownness or another way, that each of them can have influence on activity other companies, have an access to knowledge, resources and to partake responsibility with them.

Modern intercommunications within the framework of international division of labor are characterized asymmetricness. They are more expressed as between the highly developed states states which develop; by the east Europe countries and countries with the developed economy; and in a less measure they appear in the international copulas of countries from approximately identical economic and by scientific and technical potential.

2. Took out a capital as a leading form of international economic relations

Took out a capital is an exception of part of capital from the process of national appeal and plugging in a production process or in an appeal in different forms in other countries.

Purpose of capital exports - to get the higher norm of income due to advantages, linked with the use of international factor of production by comparison to the national terms of menage.

Personal touches of modern capital exports:

1. Growth of scales of export of production capital.

2. Took out a capital began to be carried out mainly between the highly developed states.

3. At the beginning 70-x years the role of countries which develop grows, as exporters of capital (Saudis Arabia, Arabic Emirates, Mexico, are Incorporated, Venezuela and others like that).

4. Took out a capital appeared the form of including of countries which develop, in MPP in industries of electronics, engineer, science, informatics and

transformation of them, for world leaders after the row of directions of modern world production (South Korea, Singapore, Malaysia).

5. A change of of a particular branch structure of capital exports is growth of rates of direct foreign investments in the newest technologies and services.

6. In the last decades took out a capital made terms for intensive development of transnational form of internationalization of production.

3. International trade: role, volume, structure and features. Balance of payments. Auction deficit

International trade is a form of international economic relations at mediation of export and import of commodities and services, which is based on international division of labor (IDL).

Reasons of international trade:

- Event in distributing and material well-being the economic resources of different countries.
- Effective production of various technologies or combination of resources.

The volume of international trade is characterized the dynamics of indexes of export, import of commodities and services and clean export, by their attitude toward a gross national product.

Functions of international trade:

1. Overcomes narrow-mindedness of national resource base.
2. Extends the capacity of internal market and sets connections of national market with world.
3. Provides the receipt of additional profit due to the difference of national and international charges of production.
4. Extends the scales of production, which are limited possibilities of productions.
5. Assists development of specialization of country, growth of the productivity of the use of resources, increase of production volumes.

In accordance with principle of comparative advantages, which was offered D. Rikardo in 1817 year, the combined volume of products will become maximal then, when every commodity will be made a that country which lower charges are in.

Free trade which is based on principle of comparative advantages enables a world economy to attain more effective placing of resources and higher level of financial welfare.

Protectionism

A protectionism policy which by duties or administrative adjusting of trade is directed on protecting of one or a few industries of production from a foreign competition diminishes or erects to the zero benefits from specialization.

Reasons of revival of protectionism:

- liberalization of trade;
- strengthening of competitiveness of foreign firms is in a national economy;
- exceeding of import above an export and saving of proof auction deficit is in separate countries.

Protectionism measures	
Tariffs	Not tariffs barriers
Tariffs determine size state fees from commodities, values and property, at crossing of scopes of country, that duty.	A quota of import - export is establishment of quotas on an import or took out commodities in quantitative or cost expression.
Advalern a duty is the fixed percent from the cost of commodity.	Voluntarily limitation of export - to limit an obligation or not extend the volume of export.
The special duty is a hard rate for the set unit of commodity (weight, volume and others like that).	Difficult custom procedure.
A difficult duty is a simultaneous exception of advalern and special duty.	Technical and sanitary standards.
	Currency limitations of import of commodities.

Protectionism is the practice of following protectionist trade policies. A protectionist trade policy allows the government of a country to promote domestic producers, and thereby boost the domestic production of goods and services by imposing tariffs or otherwise limiting foreign goods and services in the marketplace.

Protectionist policies also allow the government to protect developing domestic industries from established foreign competitors.

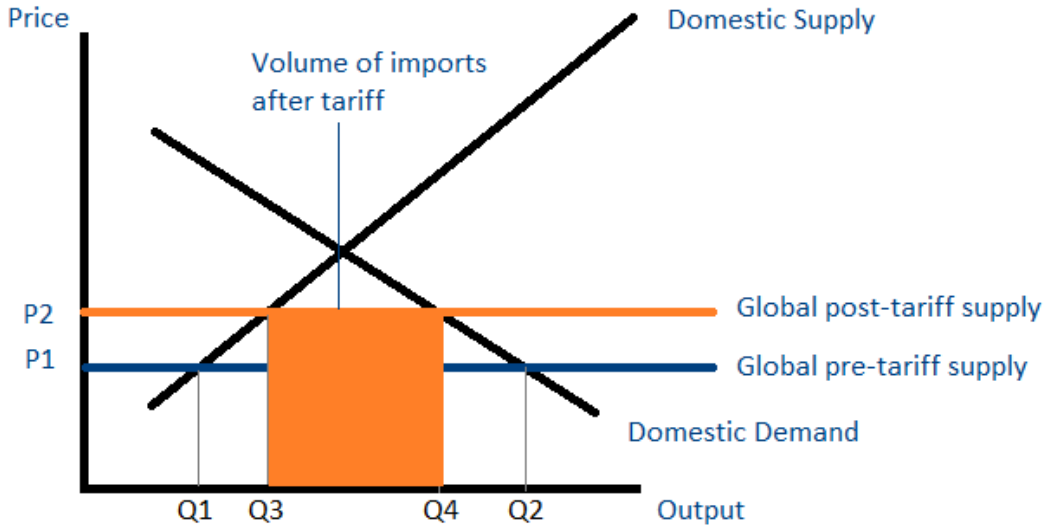
Types of Protectionism

Protectionist policies come in different forms, including:

1. Tariffs

The taxes or duties imposed on imports are known as tariffs. Tariffs increase the price of imported goods in the domestic market, which, consequently, reduces the demand for them.

Consider the following example, which analyzes the UK market for US-made shoes. Due to the imposition of tariffs, the price for the product increases from GBP100 (P1) to GBP120 500 (P2). The demand for US-made shoes in the UK market decreases (from Q2 to Q4).



2. Quotas

Quotas are restrictions on the volume of imports for a particular good or service over a period of time. Quotas are known as a "non-tariff trade barrier." A constraint on the supply causes an increase in the prices of imported goods, reducing the demand in the domestic market.

3. Subsidies

Subsidies are negative taxes or tax credits that are given to domestic producers by the government. They create a discrepancy between the price faced by consumers and the price faced by producers.

4. Standardization

The government of a country may require all foreign products to adhere to certain guidelines. For instance, the UK Government may demand that all imported shoes include a certain proportion of leather. Standardization measures tend to reduce foreign products in the market.

Reasons for Protectionism

An economy usually adopts protectionist policies to encourage domestic investment in a specific industry. For instance, tariffs on the foreign import of shoes would encourage domestic producers to invest more resources in shoe production.

In addition, nascent domestic shoe producers would not be at risk from established foreign shoe producers. Although domestic producers are better off, domestic consumers are worse off as a result of protectionist policies, as they may have to pay higher prices for somewhat inferior goods or services. Protectionist policies, therefore, tend to be very popular with businesses and very unpopular with consumers.

Advantages of Protectionism

- **More growth opportunities**: Protectionism provides local industries with growth opportunities until they can compete against more experienced firms in the international market
- **Lower imports**: Protectionist policies help reduce import levels and allow the country to increase its trade balance.
- **More jobs**: Higher employment rates result when domestic firms boost their workforce
- **Higher GDP**: Protectionist policies tend to boost the economy's GDP due to a rise in domestic production

Disadvantages of Protectionism

- **Stagnation of technological advancements**: As domestic producers don't need to worry about foreign competition, they have no incentive to innovate or spend resources on research and development (R&D) of new products.
- **Limited choices for consumers**: Consumers have access to fewer goods in the market as a result of limitations on foreign goods.
- **Increase in prices (due to lack of competition)**: Consumers will need to pay more without seeing any significant improvement in the product.
- **Economic isolation**: It often leads to political and cultural isolation, which, in turn, leads to even more economic isolation.

Balance of payments

Balance (ZB) of payments is a statistical report, given in form business accounts, about the commercial and financial treaties of economic subjects of country with a foreign country for certain period of time, as a rule for a year.

Structure of balance of payments

Account of balance of payments	**Credit** (receipt of money)	**Debit** (charges of money)	**Balance**
1.Balance of trade	A profit yield is from the export of commodities	Charges are on the import of commodities	
2.Balance of services	A profit yield is from the grant of services a foreign country	Payment of services, got from a foreign country	
3.Balance of translations	Translations oversea subjects	Translations are from oversea subjects	
4.Current operations (1+2+3)			NE (net export)
5.Operations are with a capital	Import of capital	Export of capital	NEC (net export of capital)
6.Currency backlogs of National of bank	Increase of currency backlogs of foreign country	Increase of currency backlogs of country	DR (account of currency backlogs balance)

If NEC > 0, a country has a clean outflow of capitals, and at NEC < 0 - is a clean wave of capitals.

The deficit of balance of payments means that the population of country for this period paid foreigners more than (payment of import of blessings + export of capital) got from them (a profit yield is from the export of blessings + import of capital), and that is why foreigners have a certain sum of money, which equals the size of deficit of balance of payments of this country. These money will be produced in the National bank of country for an exchange on devezes (foreign currencies), that will result in an exchange of the National bank loss.

If ZB > 0, currency backlogs of the National bank grow.

Shapter 12
Currency system

In this chapter we will explore:

1. Currency system. Convertibility of the currency. Rate of exchange and factors, that influence on its change.
2. International currency-credit system.
3. Migration of labour power as a form of international economic relations. Migration balance.

1. Currency system. Convertibility of the currency. Rate of exchange and factors, that influence on its change.

Foreign economics relations between countries stipulate necessity in exchange of their national currency.

National currency – is a currency note of the given country, which is used in international computations with other countries.

Reserved currency – is national currency–credit means of the leading countries, which are used for computations of foreign economics operations, international investments, during fixing the prices.

Locked up currency –is a national currency, which functions only within the limits of one country and is not exchanged for foreign currencies.

Free convertible currency – is a currency, which is freely and unlimitedly exchanged for foreign currencies.

Convertibility of the currency – is the ability of national currency note to be easily used in international pay circulation for maintenance of different international computations.

Currency exchange and computations between countries are fulfilled on the reason of rate of exchange.

Rate of exchange – is a price of the currency note of the country, expressed in currency notes of other countries.

Currency parity – is a legislative established ratio between two currencies, which is the base of the rate of exchange.

Parity of the purchasing power– is a correlation of the purchasing power of two or more currencies accordingly to a definite set ("basket") of goods and services.

System of the rate of exchange

Two opposite variants of the system of rate of exchange exist:

1. The system of fixed rate of exchange, which supposes interfering of the state into their changes.
2. The system of flexible (sailing) rate of exchange, during which the rate of exchange of the national currency is determined by demand and supply.

Factors, which determine the rate of exchange:

1. Economic events:
- change of demand;
- change of effectiveness;

- state, financial and money policy.

2. Prices, percentage rate.
3. Political and psychological factors, expectation.
4. Demand and supply of international currency.

Measures of regulation of currency market prompt the government to maintenance devaluation or revaluation of their national currencies.

Devaluation – is goal-directed actions of the government on decreasing of exchange rate of exchange of the country.

Revaluation – is actions of the government, oriented on increasing of exchange rate of national exchange.

Devaluation means, that the goods of the country become cheaper on the international market, so long as other countries pay for them less currency. Goods, bought abroad, become more expensive, and it leads to decreasing of import (decreasing of internal demand on imported goods).

Correction of national rate of exchange can be fulfilled with the help of currency taking stock.

Currency taking stock – is the influence on the rate of national currency by means of buying–and– selling of foreign currency.

2. International currency–credit system

International currency–credit system is a totality of rules, laws, establishments, which regulate activity of central emissive banks in external currency markets.

Peculiarities of the currency regime in Ukraine during transitional period:

1. High rates of inflation increase demand on the foreign currency and decrease the rate of national currency.
2. Shortage of export decrease possible piling up of the foreign currency.
3. A great state debt, deficit of purchasing balance, money emission decrease demand on the state currency.
4. Non-effective structure of economy, export та import decrease coming of the foreign currency.
5. Non-stability of economic and political state causes flow-out of the currency to foreign banks, which decreases its supply on the external market of Ukraine and accordingly leads to decreasing of the rate of national currency.

Necessary conditions of ensuring of convertibility of national currency:

1. Finishing credit emission of paper money, which are not ensured by goods and services.
2. Maximum decreasing of military expenses, non-effective capital construction, refusal from financial injections for support of unprofitable enterprises.
3. Limitations of social programs, which are not ensured by money and other resources.
4. Stimulation of production of goods and services, which are able to counteract increasing money weight, in circulation.
5. Consecutive conducting the line on stabilization and strengthening by the National bank the rate of exchange of hryvnja with the help of firm currency–credit

policy, introduction of measures of the regime of imitation of convertibility of hryvnja, mobilization of internal and external current resources, taking stock on the current market.

6. Receiving on favorable conditions assistance from International Currency Fund and big banks of the "seven" highly developed countries.

7. Wide drawing of foreign capital into the economy of Ukraine.

3. Migration of Labor Forces

Migration of labor forces is one of the forms of international economic relations. Labor migration is movement of population beyond the borders of the country. Migration saldo is the difference between number of people, that left the country (emigrants) and number of people that came to live in the country contemporarily(immigrants).

Reasons of the international Labor migration

Economical:

- Decease of demand on the low-qualified labor force and its increased supply
- Increased demand on highly qualified specialists in the USA and Western
- Interstate differences in
- Differentiation of the labor force demand (need in qualified and non qualified employees as well)

Foreign Economic:

- demographical;
- political-legal;
- religious;
- national;
- cultural;
- family;
- Psychological;
- Ecological.

Main migration directions:

Europe, Asia, Central America ——————> the USA, Canada

Mediterranean countries, Eastern Europe, republics of the former USSR, Arabic countries ——————> Western Europe

Exam questions for Economics: macroeconomics

1. Macroeconomics as a component of Economics. Economic system structure and the types.
2. Macroeconomic methods and principles of research.
3. Economic Models.
4. The Main Macroeconomic indices: GDP, National income, GVA.
5. Aggregate demand (AD) and Aggregate supply (AS) Model.
6. The equilibrium of aggregate demand and aggregate supply in shortrun and long-run period.
7. The Keynesian Cross Model.
8. Consumption and saving functions. Marginal propensity to consume.
9. The multiplier in the AD-AS model.
10. Investment Function and Accelerator principle.
11. The IS Curve and the way of its building.
12. Interests and needs: the dialectics of interdependence as the driving force of socio-economic progress.
13. Commodity production as the basis of a market economy and its role in the economic development of society. The features of the commodity.
14. Theories of value and their varieties.
15. The law of value, essence, mechanism of its operation and function.
16. Appearance, essence, functions, types of money. Money circulation.
17. Capital as a factor in production. Circulation and turnover of capital.
18. Interests and needs: the dialectics of interdependence as the driving force of socio-economic progress.
19. Commodity production as the basis of a market economy and its role in the economic development of society. The features of the commodity.
20. Theories of value and their varieties.
21. The law of value, essence, mechanism of its operation and function.
22. Appearance, essence, functions, types of money. Money circulation and its laws.
23. Capital as a factor in production. Circulation and turnover of capital.
24. Fixed and working capital. Fixed and variable capital.
25. Wages: the essence, forms and systems of wages. Differentiation and types of income of the population.
26. Concept and types of market. Market mechanism of self-regulation.
27. The demand, price and non-price factors, the law of demand.
28. The supply, price and non-price factors, the law of supply.
29. Competition and market models.
30. The concept and essence of market infrastructure, its main elements. Infrastructure functions.
31. Model of the circulation of resources, goods and income. Households.
32. Economic content of ownership and ownership. Objects and subjects of ownership. Place of ownership in the system of production relations.

33. Firm (enterprise) - organizational form of entrepreneurship. Types of enterprises and their associations.

34. Agrarian sphere of production and its features. The essence of agrarian and land relations.

35. Essence and sources of loan capital. Interest rate.

36. The process of social production and its components: objects of labor, means of labor, labor.

37. Results of economic activity: aggregate public product. The ultimatesocial product. National Income. Gross national product. Gross Domestic Product. National wealth.

38. Economic growth as a reflection of the extended reproduction process. Types of economic growth.

39. Cycles of social reproduction. Types of cycles. Phases of economic cycles. Theories of economic cycles.

40. State regulation of social reproduction and its form.

41. The Money Market. Its components and equilibrium.

42. The LM Curve.

43. The Definition, the Functions and the Types of Money.

44. The Monetary System.

45. The Monetary Policy and its Effectiveness.

46. Business Cycle and economic fluctuations.

47. Models of economic cycles and State regulation of economic cycles.

48. Inflation: Its Causes, effects, and Social Costs.

49. Unemployment and its types.

50. Labor market and its equilibrium.

51. Hixs – Hansen model for three markets.

52. Economic growth and its factors.

53. Keynes' models of economic growth.

54. Neoclassical model of economic growth.

55. Fiscal policy and its Effectiveness.

56. Government Debt and Budget deficits.

57. The Balance of Trade and National Income: A Closed Economy and An Open Economy.

58. Macroeconomic Equilibrium in Open Economy. Mundel-Fleming Model.

59. International Capital Mobility.

60. The main forms of international economic relations and types of integration formations.

Forms of training

The main principles of the training are differentiation and individualization, optimally combination of the human and technical potential, communication and dialogue. In order to achieve the main goals of this course there are next methods: lections, seminars, trainings, worth orientation, case study, coaching, role-playing games, work in pairs, method of reflection, method of rotation, "leader and driven" method, "flying", mythologems, brainstorm, thematic discussions, consulting, participation in the conferences, exhibitions, use of information and computer technologies.

Solve the next tasks.1.

Year	GDP at current price	GDP at constant prices of 2010	Deflators 2010 = 100
1st	1079346	1079346	
2nd	1299991	1138338	
3rd	1404669	1141055	
4th	1465198	1140750	
5th	1586915	1066001	
6th	1988544	961821	

2.

Year	GDP	Final consumption expenditure	Gross capital formation	External balance of goods and services
1st		897583	225296	-43533
2nd		1094231	291678	-85918
3rd		1221163	305031	-121525
4th		1329632	270895	-135329
5th		1429959	212591	-55635
6th		1709213	316841	-37510
Structure, %				
1st	100			
2nd	100			
3rd	100			
4th	100			
5th	100			
6th	100			

3. Consider an economy of the country, which is described with the next data (billion euro): C=30+0,7(Y-T); Y=250; T=45. How much is aggregate demand, which is computing from the expenditure side?

4. Consider an economy, where the nominal GDP is 185,2 billion euro, consumers expenditures are 55%, gross domestic investment 22%, net export 5%. Compute a rate and an amount of government expenditure.

5. In the Keynesian cross, assume that the consumption function is given by C=200+0.75(Y- T). Planned investment is 100; government purchases and taxes are both 100.

a) Graph planned expenditure as a function of income.

b) What is the equilibrium level of income?

c) If government purchases increase to 125, what is the new equilibrium income?

d) What level of government purchases is needed to achieve an income of 1,600?

6. In the Keynesian cross model, assume that the consumption function is given by C=120+0.8(Y-T). Planned investment is 200; government purchases and taxes are both 400.

a. Graph planned expenditure as a function of income.

b. What is the equilibrium level of income?

c. If government purchases increase to 420, what is the new equilibrium income?What is the multiplier for government purchases?

d. What level of government purchases is needed to achieve an income of 2,400? (Taxes remain at 400.)

e. What level of taxes is needed to achieve an income of 2,400? (Government purchases remain at 400.)

Tests are for independent verification of knowledge

1. Macroeconomics probes economic processes at level:

1. enterprises;
2. industries of production;
3. separate market;
4. national economy.

2. The objects of macroeconomic analysis characterize:

1. aggregate sizes;
2. credible sizes;
3. comparative sizes;
4. relative sizes.

3. Comes forward the object of macroeconomic analysis:

1. economic law;
2. economic process;
3. economic system;
4. economic relations.

4. The basic method of macroeconomic researches is:

1. comparative analysis;
2. sociological;
3. method of abstraction;
4. economic-mathematic design.

5. Whatever sector does behave to the macroeconomic subjects?

1. enterprise sector;
2. sector of households;
3. state sector;
4. agricultural sector.

6. Macromodels show:

1. objective growth of index;
2. intercommunication is between macro indexes;
3. connection is between state subjects;
4. connection is between exogenous sizes.

7. What from the resulted answers represents the technical functional copulas of endogenous parameters of macromodel?

1. $C = C(Y)$;
2. $Q = f(X_1,X_2,...,Xn)$;
3. $T = f(T(Y) \bullet Y))$;
4. $Y = C+I+G+NE$.

8. What from the resulted answers represents the conductional functional copulas of endogenous parameters of macromodel?

1. C = C (Y);
2. Q = f (X_1,X_2,...,Xn);
3. T = f (T(Y) • Y));
4. Y = C+I+G+NE.

9. What from the resulted answers represents the institutional copulas of endogenous parameters of macromodel?

1. C = C(Y);
2. Q = f (X_1,X_2,…,Xn);
3. T = f (T(Y) • Y));
4. Y = C+I+G+NE.

10. What from the resulted answers represents definitions functional copulas of endogenous parameters of macromodel?

1. C = C (Y);
2. Q = f (X_1,X_2,...,Xn);
3. T = f (T(Y) • Y));
4. Y = C+I+G+NE.

11. It is necessary for expansion of production potential of country, that:

1. NNP exceeded NI;
2. clean investments exceeded the size of depreciation;
3. NI exceeded the volume of consumer charges of population and state;
4. GNP exceeded NNP on the size of depreciation.

12. NI differs from the profit of the eventual use of households on a size:

1. profits of population, got from a foreign country;
2. depreciations;
3. profits from individual labor activity;
4. transfer payments of the state a population.

13. The preliminary created cost must not be taken into account at determination of the combined made cost in a national economy, for that:

1. to avoid inflationary processes;
2. to eliminate the unproductive charges of previous cycle;
3. to avoid a double account;
4. all answers are correct.

14. Aggregate volume of commodities and services, made in a country for a year, - it:

1. national riches;
2. gross domestic product;

3. national income;
4. clean economic welfare.

15. To transfer payments belong:
1. school building;
2. payment of civil servants;
3. taxes;
4. a help is on unemployment.

16. A clean export is positive, when:
1. an export anymore than import;
2. an export diminishes, and an import grows;
3. an export and import diminish;
4. an import anymore than export.

17. Enterprise economies - it:
1. income which is outlaid on the personal consumption of businessman;
2. share of profits which remains on an enterprise for expansion of production;
3. share of profits which a businessman saves on the personal necessities: income which is outlaid on the real estate;
4. income which is outlaid on the real estate.

18. Direct tax - it:
1. a tax is on beer;
2. a tax is from an appeal;
3. a tax is on oil;
4. income-tax.

19. A profit from a property contains a receipt from:
1. to the redistribution of income of stock associations;
2. to engage;
3. gross receipt of individual households;
4. statutory and voluntarily social charges of businessmen.

20. Will nominal GNP be determined?
1. on prices previous a year;
2. on the costs of current year;
3. on prices next year;
4. on prices by a base a year.

21. Profit of the eventual use - it:
1. an wage is plus current economies;
2. the personal income is minus individual taxes and untaxed payments;
3. pay-envelope basic and additional;

4. amount of monies, which consists of payment, rent and profit, in form percent for a capital.

22. Gross private investments are taken into account at a calculation:

1. to the profit of the eventual use;
2. personal income;
3. GNP by the method of charges;
4. GNP by the method of profits.

23. What from the transferred aggregation sizes are not used for determination of national income?

1. percents which pay businessmen for a capital;
2. income of corporations;
3. wage;
4. state transfer payments.

24. Personal income - it:

1. sum of economies of private individuals;
2. all profit, appointed on the personal consumer charges after payment of taxes;
3. profit, got households during this year;
4. all answers are wrong.

25. If from a national income to deduct income taxes, not distributed incomes and payments, corporations on social security, and then to add clean transfer payments, got sum - it:

1. national income;
2. personal income;
3. profit of the eventual use;
4. net national product.

26. Transfer payments - it:

1. payment households which are not conditioned participation in the process of production;
2. part of profit, which joins in a national income;
3. only payments a government to the individuals;
4. all answers are wrong.

27. What from the offered measures did consider most acceptable to stimulation of economies supporters of classic theory?

1. a decline of taxes is on profits;
2. increase of interest rate;
3. an increase of help is on children;
4. increase of bonuses on an economy, which go to building.

28. What from the offered measures, on your opinion, most full does expose essence of concept „marginal propensity to the consumption"?

1. a maximum size of consumer charges is at this level of profit;
2. change in consumer charges, caused the change of profits;
3. a relation of increase of consumer charges is on unit of increase of profit of the eventual use;
4. attitude of the combined consumption is toward the combined demand.

29. Using the resulted variants of answers, rotin connection between marginal propensity to the consumption and marginal propensity to the economy:

1. the sum of indexes of marginal propensity to the consumption and marginal propensity to the economy equals the profit of the eventual use;
2. a relation between these indexes characterizes middle propensity to the consumption;
3. the sum of these indexes is evened 1;
4. a point on a curve, which they are counterbalanced in, answers the threshold level of profit.

30. On the Keynes theory the volume of consumer charges depends in a country, foremost, from:

1. level of development of country;
2. rates of growth of suggestion of money;
3. level of profit of the eventual use;
4. amounts of residents.

31. The line of IS will not change the position, if:

1. at any level of the real income economies will go down on the size of increase of clean export;
2. households change marginal propensity to the economies at the that volume of economies;
3. growth of the government spending is carried out due to additional charges;
4. at any rate of percent investments will be abbreviated on the size of the additional government spending.

32. At the financial market takes a place:

1. providing of enterprises the mediums of exchange;
2. transformation of economies is in an investment;
3. a redistribution of NI is with the purpose of decline of differentiation of individual profits;
4. diminishing of velocity of circulation of money.

33. The effect of employment at the change of standard of prices is determined a change:

1. suggestions of labor force;

2. demand prices are on labor force;
3. to demand on labor force;
4. points of equilibrium are at the market of labor force.

34. Financial basis of large cycle is:
1. necessity of update of the fixed assets;
2. necessity of change of base technologies and generations of machines and update of objects of infrastructure;
3. processes which take a place at the money market;
4. all of answers are correct.

35. The measures of anticrisis policy do not include:
1. adjusting of external activity;
2. manipulation the state Budget;
3. wage control;
4. adjusting of tax rates.

36. A national debt is a sum of previous:
1. budgetary deficits;
2. government spending;
3. budgetary surpluses after deduction of budgetary deficits;
4. budgetary deficits after deduction of budgetary surpluses.

37. The effect of expulsing provides for:
1. the consumption of commodities and services grows, and the volume of investments is abbreviated;
2. an import is ousted domestic commodities;
3. growth of the government spending results in diminishing of private investments;
4. growth of private investments results in diminishing of the government spending.

38. A governmental policy in industry of charges and taxation is named:
1. by a monetary policy;
2. by the policy of allocation of profits;
3. by a policy, founded on the amount of theory of money;
4. by a fiscal policy.

39. The general amount of money grows each time commercial jars:
1. increase the deposits at a National bank;
2. withdraw part of the money in the National bank;
3. diminish the obligations after current accounts, paying an available or cashless money on payments;
4. increase the volumes of loans which get a population.

40. If a norm of obligatory backlogs is 100%, the size of money multipliers evened:

1. 0;
2. 100;
3. 1;
4. -1.

41. Inflation of demand arises up in terms:

1. underemployment;
2. what approach full employment;
3. full employment;
4. growth of marginal propensity is to the consumption.

42. Inflation which is caused surplus demand can be illustrated:

1. by the change of the crooked aggregate supply to the left;
2. by the change of combined demand curve to the left;
3. by the change of combined demand curve to the right;
4. by the change of the crooked aggregate supply to the right.

43. In a period speed-up inflation interest rate:

1. grows, because the cost of money goes down;
2. goes down, because the cost of money goes down;
3. does not change;
4. grows, because the level of employment goes down.

44. If a man is sick and can not work, it:

1. belongs to the digit of unoccupied in a production;
2. belongs to the unemployed persons;
3. not taken into account in composition labor force;
4. examined however fully busy.

45. By Oukens law the 2% increase of actual unemployment rate means above his natural level, that lag of actual volume of GNP makes from the real:

1. 4%;
2. 5%
3. 2%;
4. considerably anymore after 5%.

46. Country A can make a 1 t wheat or 4 ton metal, utilizing one unit of resources. A country B would make a 2 ton wheat or 5 ton metal, utilizing one unit of resources also. At these terms:

1. country A will export a wheat and import a metal;
2. country B not will export and import a wheat;
3. a country B would export a wheat and import a metal;
4. a country B would not export and import a metal.

47. What from the resulted forms of trade barriers is not a substantial obstacle for free trade?

1. imported quota;
2. are there licenses to an export and import?
3. voluntarily export limitations;
4. there is not a right answer.

48. The system of gold standard operates. Country A substantially increased the export of commodity in a country. In this situation:

1. standard of prices in a country A will go down, and in a country will grow;
2. standard of prices in a country A will grow, and in a country will go down;
3. standard of prices in a country A will go down, and it is possible in a country, will change, possibly - no;
4. standard of prices in a country A will go down, possibly, will change, possibly - no, and in a country will go down.

49. For basis of growth in the R.Solou model accepted:

1. growth of the labor productivity;
2. growth of product;
3. growth of standard of prices;
4. growth of employment.

50. Economy growing it can be illustrated:

1. by motion of point on possibilities of productions;
2. by a change to the left of possibilities of productions;
3. by a change to the right of possibilities of productions;
4. by motion from one point to other outside possibilities of productions.

51. After the model of IS-LM of pond of percent determined as a result of co-operation:

1. to demand and supply at the money market;
2. to demand and supply at the market of commodities and services;
3. to the market of commodities and services at the financial market;
4. money-market with the market of equities.

52. After the theory of multiplier the increase of NI anymore than increase of investments because:

1. maximum efficiency of capital investments exceeds the rate of percent;
2. investments increase production potential of economies;
3. investments anymore than economy;
4. growth of investments increases other component parts of demand.

53. At the market of commodities and requiring payment services, money and securities an equilibrium is not arrived at, if:

1. C = S;
2. S = I;
3. a value of NI is a that rate of percent does not answer an intersection lines of IS and LM;
4. all of answers are wrong.

54. A supply of labor force price is determined:
1. by a maximal payment;
2. by a minimum wage;
3. by a nominal payment;
4. by the standard of prices.

55. Financial basis of periodicity of middle cycles is:
1. necessity of update of the fixed assets;
2. a necessity of proceeding in an equilibrium is at the user market;
3. processes which take a place at the money market;
4. necessity of update of objects of infrastructure.

56. The basic instrument of neoclassical analysis of the economy growing is:
1. price index;
2. production function;
3. ex post analysis;
4. economic system.

57. Inflation is a tax on:
1. government, it increases the sizes of budgetary deficit;
2. proprietors of national debt, it increases the sizes of budgetary deficit;
3. proprietors of national debt, it abbreviates the sizes of budgetary deficit;
4. government, it abbreviates the sizes of budgetary deficit.

58. A considerable budgetary deficit allows:
1. to increase the rate of percent, promote the international value of national currency and increase the volume of clean export;
2. to decrease the rate of percent, reduce the international value of national currency and increase the volume of clean export;
3. to increase the rate of percent, reduce the international value of national currency and increase the volume of clean export;
4. to increase the rate of percent, promote the international value of national currency and decrease the volume of clean export.

59. If a government provides for to promote the level of real GNP, he can:
1. to reduce the public purchasing of commodities and services;
2. to reduce the level of budgetary deficit;
3. to reduce taxes;

4. to decrease transfer payments.

60. The increase of sum of permanent payments is maximally possible evened:

1. to surplus backlogs, to part on the size of money cartoonist;
2. differences between active and obligatory plus a property asset;
3. differences are between actual backlogs and surplus;
4. to surplus backlogs, to increased on the size of money cartoonist.

Tasks are for independent work of students

Exercise *1.* Using the data of the table find: GNP, consumption, NNP, net private investments.

Indicators	1st year	2nd year
The value of new building	7	7
The value of produced equipment	14	14
The value produced consumption goods	154	126
The value of goods, that have been consumed	126	154
Amortization of building	14	14
Amortization of equipment	14	14
Stock of consumption goods at the beginning of year	42	70
Stock of consumption goods in the end of year	70	42

Exercise *2.* Using the data of the table find: the builders' contribution in the creation of GNP. How to avoid double accounting while measuring GNP? Determine "add value" and explain ways of its calculation.

Production	Final sum of sale (n.m.u.)	Buying of commodities that are necessary for productions
Building	20000	–
Glass	500	200
Bricks	12000	4000
Paints	420	0
Other	3080	4300

Exercise *3.* What should the equilibrium amount of production of goods be to cause demand on autonomous investment in the dimension of 120 n.m.u., if autonomous consumption is 30 n.m.u. and marginal propensity to consumption is 0,4?

Exercise *4.* Using the data of the table find: GNP (by the incomes and by the costs), personal income, ended communion profit, the quantity of net export.

№	Indicators	n.m.u.
1	Export	550,5
2	Dividends	90
3	Amortization	460,5
4	Wage	2163
5	State purchasing of goods & services	1865,5
6	Rent	49,5
7	Indirected taxes	385,5
8	Additional payments to wage	420
9	Gross private investments	1113,5
10	Taxes & incomes of the corporation	132
11	Transfer payments	480
12	Interest rate	301,5

13	Income of individual owner's	198
14	Consumption expenditure	2782,5
15	Import	507
16	Social insurance payments	222
17	Non-distribute profit	825
18	Personal income taxes	558

Exercise *5*. Using the following data (in n.m.u.) calculate macroeconomic indicators write them down into the table. Find the investment multiplier.

$C=200+0,75Y_{DI}$, I=200, E=125, Z=25, T=G=200

National income	Taxes	Derive income	Consumption	Invest-ments	State expenditure	Net export	AD
1800							
2000							
2200							
2400							
2600							

Exercise *6.* The data in the table characterize close economy that function at constant price level and absence of the state intervention. Calculate: marginal propensity to consumption, marginal propensity to savings and investment multiplier.

Real NNP	Consumption costs	Savings	Planned investments	Total costs	Deflection of real investments from scheduled
1300	1290	10	22		
1310	1298	12	22		
1320	1306	14	22		
1330	1314	16	22		
1340	1322	18	22		
1350	1330	20	22		
1360	1338	22	22		
1370	1346	24	22		
1380	1354	26	22		
1390	1362	28	22		
1400	1370	30	22		

Exercise *7.* The consumption function is C = 200+0,6Y; I=500. Find the equilibrium NI and its variation while investments increase on 100 n.m.u.

Exercise *8*. The savings function is S = –20+0,4Y; I=20 n.m.u. Find: the equilibrium NI multiplier and the quantity of savings.

Exercise *9.* The behavior of macroeconomical subjects is characterized with the following data: $C = 0,8Y^{V}+90$; I=0.225Y+30; G=T; E=180; T(Y)=0,375; Z(Y)=0,2. Find the equilibrium NI.

Exercise *10.* Using the data of the table calculate average and marginal tax rates. What is the form of the tax: progressive; proportional, regressive?

Income	Tax	Average tax rates	Marginal tax rates
0	0		
50	5		
100	15		
150	30		
200	50		
250	75		

Exercise *11.* The national economy is characterized with the following data: real income is 4000 n.m.u., marginal propensity to consumption is 0.8; equilibrium income is 4200 n.m.u. How should governmental costs and the amount of tax incomes change, so that economy achieves equilibrium if other data are stable?

Exercise *12.* The economy of Ukraine is in equilibrium if consumption of households is determined by the function $C = 100+0.8Y^V$, the investments 100, state expenditures on buying of goods are 200, transfer payments from the budget are 62,5, rate of profit tax is 0,25. Find the equilibrium NI and multiplier.

Exercise *13*. The leading economists forecast that in a year economic situation in country will be characterized with the following data: C = 100+0,7Y; I = 100 n.m.u.; G = 200 n.m.u.; Z(Y) = 0,2. Calculate a forecasted level of GNP.

Exercise *14.* Using the data of the table find the quantity of currency aggregate M_1, M_2, M_3.

Indicators	n.m.u.
Short term payments	1630
Long term payments	645
Check payments	448
Non-check saving payments	300
Cash	170

Exercise *15.* Liabilities of the commercial bank's balance include (in mln. n.m.u.): payments poste restate – 1000; term payments – 500. standard of reserve reimburse of payments poste restate – 30%,and standard of reserve reimburse of term payments – 20%. On what sum can the bank increase credits if a half of payments poste restate will be re-legalize into term payments?

Exercise *16.* The level of real unemployment is 10%, of nature is 6%. Real GNP is 200 mln. grn. Find losses of GNP because of the cyclic unemployment.

Exercise *17.* Find deflation rate if price index of 2006 is 98%, 2005 is a basic year.

Exercise *18.* Find price increment if price indexes of 2007 are 128%, 2005 is a basic year.

Exercise *19.* Find inflation rate during 2000-2007 if 2005 is a basic year and price index of 2000 is 25%.

Exercise *20.* Deposits of commercial banks are 4 mlrd. grn. The norm of obligatory stocks is 25%. On what quantity may currency supply increase if the Central Bank decides to decrease the norm of obligatory stocks?

Exercise *21*. The norm of obligatory stocks is 12%, accessed stocks are 3% of the sum of deposits. What is the quantity of deposits if the total sum of stocks is 45 bln. grn., and cash is 150 bln. grn.?

Exercise *22*. In closed economic system without state intervention the amount of savings of the n^{th} year is determined with ther formula $S_n = Y_{n-1}-160$, annual autonomous investments are 400 n.m.u. At such circumstances the dynamic equilibrium is fixed at $Y_{n-2}=1600$ n.m.u. Find: the equilibrium NI in the $(n-1)^{th}$ year; an increasing rate of NI; NI of the n^{th} year if an increasing rate is constant.

Exercise *23.* In the economy of a certain country it is considered reasonable to have production stocks of 2.5 n.m.u. per each n.m.u. of the quantity of sale in the end of every year. Using the data of the table calculate unknown indicators and write them down.

Year	The quantity of sale	Stocks at the beginning of the year	Expected stocks in the end of the year	The quantity of production of the year
n+1	40	100		
n+2	50			
n+3	60			
n+4	55			
n+5	50			

Exercise *24.* In the state A an inflation rate is 9%, and in the country B it is 5%. In A interest rate is 12%. What should interest rate be in B to avoid pouring of the capital among these countries.

Exercise 25 The domestic demand for bicycles is given by $P = 36-0.3Q$. The foreign supply is given by $P = 18$ and domestic supply by $P = 16+0.4Q$.

(a) Illustrate the market equilibrium on a diagram, and compute the amounts supplied by domestic and foreign suppliers.

(b) If the government now imposes a tariff of $6 per unit on the foreign good, illustrate the impact geometrically, and compute the new quantities supplied by domestic and foreign producers.

(c) In the diagram, illustrate the area representing tariff revenue and compute its value.

Exercise 26 The domestic demand for office printers is given by $P = 40-0.2Q$. The supply of domestic producers is given by $P = 12+0.1Q$, and international supply by $P = 20$.

(a) Illustrate this market geometrically.

(b) Compute total demand and the amounts supplied by domestic and foreign suppliers.

(c) If the government gives a production subsidy of $2 per unit to domestic suppliers in order to increase their competitiveness, calculate the new amounts supplied by domestic and foreign producers. [Hint: The domestic supply curve becomes $P = 10+0.1Q$].

(d) Compute the cost to the government of this scheme.

Exercise 27 The domestic demand for turnips is given by $P = 128-(1/2)Q$. The market supply of domestic suppliers is given by $P = 12+ (1/4)Q$, and the world price is $32 per bushel.

(a) First graph this market and then solve for the equilibrium quantity purchased.

(b) How much of the quantity traded will be produced domestically and how much will be imported?

(c) Assume now that a quota of 76 units is put in place. Illustrate the resulting market equilibrium graphically.

(d) Compute the domestic price of turnips and the associated quantity traded with the quota in place. [Hint: you could shrink the demand curve in towards the origin by the amount of the quota and equate the result with the domestic supply curve].

Exercise 28 The domestic market for cheese is given by $P = 108-2Q$ and $P = 16+1/4Q$. These are the demand and supply conditions. The good can be supplied internationally at a constant price $P = 20$.

(a) Illustrate the domestic market in the absence of trade and solve for the equilibrium price and quantity.

(b) With free trade illustrate the market graphically and compute the total amount purchased, and the amounts supplied by domestic and international suppliers.

(c) Suppose now that the government implements a price floor in the domestic market equal to $28. Illustrate the market outcome graphically.

(d) For the outcome with a price floor, compute the quantity supplied by domestic and international suppliers respectively.

Glossary

AD/AS model: a framework used to explain the behaviour of real output and prices in the national economy.

Aggregate Demand: planned aggregate expenditure on final goods and services at different price levels, all other conditions remaining constant.

Aggregate expenditure (*AE*): the sum of planned expenditure in the economy.

Aggregate expenditure function (*AE*): the relationship between planned expenditure in the total economy and real national income or GDP.

Aggregate Supply: the output of final goods and services businesses would produce at different price levels, all other conditions held constant.

Autarky: no-trade situation.

Automatic stabilizers: tax and transfer programs that reduce the size of the multiplier and the effects of transitory fluctuations in autonomous expenditures on equilibrium GDP.

Autonomous expenditure: expenditure not related to current income.

Balance of payments accounts: a record of trade and financial transactions between residents of one country and the rest of the world.

Balance of payments: the sum of the balances in current accounts and capital accounts, minus the change in the holdings of official reserves.

Bank rate: the interest rate the central bank charges on its loans to commercial banks.

Bank reserves: cash (legal tender) held by banks to meet possible withdrawals by depositors.

Bankers risk: the risk that customers may demand cash for their deposits.

Bond coupon: the annual fixed money payment paid to a bond holder.

Bond price: the present value of future payments of interest and principal.

Bond: a financial contract that makes one or more fixed money payments at specific dates in the future.

Boom: a period of high growth that raises output above normal capacity output.

Business and investment income (*BI*): the sum of profit, interest, investment, and business income.

Business cycles: fluctuations in real GDP, employment and the price level that involve recessions, recoveries, booms.

Business cycles: short-term fluctuations of actual real GDP.

Capital account: the record of purchases and sales of real and financial assets.

Capital Consumption Allowance (*CCA*): measured depreciation of the capital stock.

Capital deepening: investment that increases in the capital/worker ratio.

Capital gain or loss: the change in the price of an asset between the date of purchase and the date of sale.

Capital stock: the buildings, machinery, equipment and software used in producing goods and services.

Capital widening: investment that provides capital to workers entering the labour force.

Central bank intervention: purchases or sales of foreign currency intended to manage the exchange rate.

Central bank: the government institution that conducts monetary policy using its control of monetary base and interest rates.

Circular flow diagrams: show the flows of money payments real resources, and goods and services between households and businesses.

Commercial paper: short term 30-day and 60-day notes designed and created to pay buyers the interest generated by bundled accounts receivable and loans of different types during the term to maturity.

Comparative advantage (principle of): even if one country has an absolute advantage in producing both goods, gains to specialization and trade still materialize, provided the opportunity cost of producing the goods differs between economies.

Comparative static analysis compares an initial equilibrium values with a new equilibrium values, where the difference is due to a change in one of the conditions that lies behind the initial equilibrium.

Complementary goods: when a price reduction (rise) for a related product increases (reduces) the demand for a primary product, it is a complement for the primary product.

Consumer Price Index (*CPI*): a measure of the cost of living in any one year to the cost of living in a base year.

Consumption expenditure (*C*): spending by households on currently produced final goods and services.

Consumption function: planned consumption expenditure at each level of disposable income.

Consumption possibility frontier: what an economy can consume after production specialization and trade.

Convergence hypothesis: higher rates of growth in lower per capita income countries than in higher per capita income countries leads to the convergence of per capita incomes across countries.

Convertible currency: a national currency that can be freely exchanged for a different national currency at the prevailing exchange rate.

Cost of credit: the cost of financing expenditures by borrowing at market interest rates.

Credit easing: the management of the central bank's assets designed to support lending in specific financial markets.

Credit money: the debt of a private business or individual.

Cross-section data: values for different variables recorded at a point in time.

Crowding out (in): the change in interest sensitive expenditures caused by the price and interest rate effects of a change in autonomous expenditure.

Currency appreciation: a rise in external value of the domestic currency that lowers the domestic currency price of foreign currency. Currency depreciation: a fall in external value of the domestic currency that raises domestic currency price of foreign currency.

Currency ratio (cr): the ratio of cash balances to deposit balances.

Current account: a record of trade in goods, services, and transfer payments.

Cyclical unemployment: unemployment that would be eliminated if output were at potential output.

Data: recorded values of variables.

Deflation: a persistent fall in the general price level.

Deflation rate: the annual percentage decrease in the consumer price index.

Demand: the quantity of a good or service that buyers wish to purchase at each possible price, with all other influences on demand remaining unchanged.

Demand curve: a graphical expression of the relationship between price and quantity demanded, with other influences remaining unchanged.

Depreciation of the national currency: a decline in the value of the currency relative to other national currencies, which results in a rise in the domestic price of foreign currencies.

Devaluation (revaluation): a reduction (increase) in the international value of the domestic currency.

Discretionary fiscal policy: changes in net tax rates and government expenditure intended to offset persistent autonomous expenditure shocks and stabilize aggregate expenditure and output.

Disposable income (*YD*): national income minus net taxes.

Disposable income: income net of taxes and transfers.

Domestic Income: total income earned by factors of production.

Dumping: a predatory practice, based on artificial costs aimed at driving out domestic producers.

Econometrics: the science of examining and quantifying relationships between economic variables.

Economic equity: concerns the distribution of well-being among members of the economy.

Economic growth: an increase in real GDP.

Economic growth rate: the annual percentage change in real GDP or per capita real GDP.

Economy-wide *PPF*: the set of goods combinations that can be produced in the economy when all available productive resources are in use.

Effective lower bound (*ELB*): a small positive number below which the central bank's policy interest rate cannot be set.

Employment income (*W*): the sum of all wages, salaries, and benefits paid to labour.

Employment rate: percent of the population 15 years of age and over that is employed.

Employment: number of adults employed full-time and part-time and self-employed.

Endogenous growth: growth determined economic behaviour and policy within the model.

Equation of exchange: the identity between total money expenditure and nominal GDP: MV = PY.

Equilibrium price: the price at which quantity demanded equals the quantity supplied.

Equilibrium real GDP: AD=AS, planned expenditure equals current output and provides business revenues that cover costs including expected profit.

Excess demand: the amount by which the quantity demanded exceeds quantity supplied at the going price.

Excess supply: the amount by which quantity supplied exceeds the quantity demanded at the going price.

Exchange rate regime: the policy choice that determines how foreign exchange markets operate.

Exchange rate target: the fixed price for foreign currency in terms of domestic currency pursued by monetary policy.

Exogenous variable: a variable with a value determined outside the model.

Exports (*X*): purchases of our domestic goods and services by residents of other countries.

Fiat money: money the government has declared as legal tender.

Final goods and services: goods and services are purchased by the ultimate users.

Financial intermediary: a business that specializes in bringing borrowers and lenders together.

Financial panic: a loss of confidence in banks and rush to withdraw cash.

Fiscal policy: government expenditure and tax changes designed to influence AD.

Fixed exchange rate: an exchange rate set by government policy that does not change as a result of changes in market conditions.

Flexible exchange rates: an exchange rate regime in which supply and demand in the foreign exchange market determine exchange rate without central bank intervention.

Foreign exchange rate: the domestic currency price of a unit of foreign currency.

Forward guidance: information on the timing of future changes in the central banks interest rate setting.

Frictional unemployment: a result the time involved in adjusting to changing labour force and employment opportunities.

Full employment output: Yc = (number of workers at full employment) × (output per worker).

GDP at basic price: Domestic Income + Capital Consumption Allowance.

GDP at market price: Domestic Income + Capital Consumption Allowance + Net Indirect Tax.

GDP deflator: index of current final output prices relative to base year prices.

Government budget balance: $BB = NT - G$.

Government budget: a plan for government spending and revenue.

Government expenditure (*G*): spending by government on currently produced final goods and services.

Growth accounting: measurement of the contributions of labour, capital, and technology to growth in output.

High (low) frequency data: series with short (long) intervals between observations.

Imports (*IM*): purchases of goods and services produced by other countries.

Index number: value for a variable, or an average of a set of variables, expressed relative to a given base value.

Induced expenditure: expenditure determined by national income that changes if national income changes.

Inferior good: one for which demand falls in response to higher incomes.

Inflation: a persistent rise in the general price level.

Inflation rate: annual percentage change in a general price index such as the CPI.

Inflation rate target: monetary policy objective defined as an announced target inflation rate.

Inflationary gap: a measure of the amount by which actual GDP is greater than potential GDP.

Innovation: the application of new knowledge into production techniques.

Intra-industry trade: two-way international trade in products produced within the same industry.

Intra-firm trade: two-way international trade in products produced within the same firm.

Intercept of a line: height of the line on one axis when the value of the variable on the other axis is zero.

Interest and investment income: income earned from financial assets.

Interest parity: interest rate differentials between countries are offset expected exchange rate changes.

Interest rate effect: the changes in expenditure caused by interest rates changes.

Interest rate: the current market rate paid to lenders or charged to borrowers.

Intermediate inputs: services, materials, and components purchased from other businesses and used in the production of final goods.

Invention: the discovery of new knowledge.

Investment (*I*): spending by business on currently produced final goods and services.

Investment function, *I = I(i)*: explains the level of planned investment expenditure at each interest rate.

Labour force: adults employed plus those not employed but actively looking for work.

Legal tender: money that by law must be accepted as a means of payment.

Liquidity: the cost, speed, and certainty with which asset values can be converted into cash.

Longitudinal data: follow the same units of observation through time.

Macroeconomics: the study of the economy as system in which feedbacks among sectors determine national output, employment and prices.

Marginal product: the change in total output caused by a change of one unit in the input of that factor to production.

Marginal propensity to consume (*MPC*): the change in consumption expenditure caused by a change in income.

Marginal propensity to import (*MPM*): the change in imports caused by a change in national income.

Marginal propensity to save (*MPS*): the change in saving caused by a change in income.

Market demand: the horizontal sum of individual demands.

McCallum Rule: central bank monetary base settings based on inflation and output targets.

Means of payment: a commodity or token generally accepted in payment for goods and services or the repayment of debt.

Microeconomics: the study of individual behavior in the context of scarcity.

Mixed economy: goods and services are supplied both by private suppliers and government.

Model: a formalization of theory that facilitates scientific enquiry.

Monetary base: legal tender comprising notes and coins in circulation plus the cash held by the banks plus reserve balances in the central bank.

Monetary policy indicators: variables that provide information about the stimulus or restraint coming from the central bank's policy.

Monetary policy instrument: the monetary variable the central bank manipulates in pursuit of its policy target.

Monetary policy: central bank action to control money supply, interest rates, and exchange rates to change aggregate demand and economic performance.

Monetary policy: changes in interest rates and money supply designed to influence AD.

Money illusion: confusion of nominal (money) and real variables.

Money multiplier: the change in the money supply caused by a change in the monetary base.

Money supply target: a central bank adjusts interest rates and the monetary base to control the nominal money supply, or the rate of growth of the nominal money supply.

Money supply: the means of payment in the economy, namely notes and coin outside the banks and bank deposits.

Moral suasion: a central bank persuades and encourages banks to follow its policy initiatives and guidance.

Multiplier $(\Delta Y/\Delta A)$: the ratio of the change in equilibrium income Y to the change in autonomous expenditure A that caused it.

NAIRU: the 'non-accelerating inflation rate of unemployment' that corresponds to NF at YP.

Natural unemployment rate: the unemployment rate that corresponds to potential GDP.

Neoclassical growth theory: an exogenous growth theory.

Net exports (NX): the difference between exports and imports.

Net indirect taxes (TIN): sales and excise taxes minus subsidies.

Net interest income: the excess of loan interest earned over deposit interest paid.

Net taxes: taxes on incomes minus transfer payments.

Neutrality of money: monetary policy can set prices and inflation rates in the long run, but not output and employment.

Nominal earnings: earnings measured in current dollars.

Nominal exchange rate (er): the domestic currency price of a unit of foreign currency.

Nominal GDP: the output of final goods and services, the money incomes generated by the production of that output, and expenditure on the sale of that output in a specific time period.

Nominal price index: the current dollar price of a good or service.

Non-tariff barriers: provisions such as product content requirements that limit the volume and gains from trade.

Normal good: one for which demand increases in response to higher incomes.

Normative economics: recommendations that incorporate value judgments.

Official exchange reserves: government foreign currency holdings managed by the central bank.

Open market operation: central bank purchases or sales of government securities in the open financial market.

Opportunity cost: the sacrifice involved when a choice is made.

Output gaps: the differences between actual output and potential output.

Overnight rate: the interest rate large financial institutions receive or pay on loans from one day until the next.

Paradox of thrift: attempts to increase aggregate national saving cause changes in equilibrium GDP that leave saving unchanged.

Participation rate: percent of the population that is either working or unemployed.

Per capita real GDP: real GDP per person.

Percentage change: (change in values)/(original value)×100.

Perfect capital mobility: when very small differences in expected returns cause very large international flows of funds.

Positive economics studies: objective or scientific explanations of how the economy functions.

Potential output (*YP*): the real GDP the economy can produce on a sustained basis with current labour, capital and technology without generating inflationary pressure on prices.

Present value: the discounted value of future payments.

Price controls: government rules or laws that inhibit the formation of market-determined prices.

Price index: a measure of a price or prices in one year compared with a price or prices in a base year.
Price level: a measure of the average prices of all goods and services produced in the economy.

Price of a marketable bond: the current price at which the bond trades in the bond market.

Prime lending rate: the base for setting the interest rates charged by banks on loans and lines of credit.

Production function: outputs determined by technology and inputs of labour and capital.

Production possibility frontier (PPF): the combination of goods that can be produced using all of the resources available.

Productivity: output per unit of input.

Productivity of labour: the output of goods and services per worker.

Profit and business income: the sum of corporate profit, small business income, and farm income.

Public debt (*PD*): the outstanding stock of government bonds issued to finance government budget deficits.

Public debt ratio (*PD/Y*): the ratio of outstanding government debt to GDP.

Purchasing power parity (PPP): a real exchange rate equal to one.

Quantitative easing: a large scale purchase of government securities to increase the monetary base.

Quantity demanded: the amount purchased at a particular price.

Quantity supplied: the amount supplied at a particular price.

Quotas: quantity restrictions on output.

Rate of economic growth: the annual percentage change in real GDP.

Real earnings: earnings measure in constant dollars to adjust for changes in the general price level.

Real exchange rate: the relative price of goods and services from different countries measured in a common currency.

Real GDP: the quantity of final goods and services produced by the economy in a specified time period.

Real interest rate: the nominal interest rate minus the rate of inflation.

Real money supply (*M/P*): the nominal money supply M divided by the price level P.

Real price index: a nominal price index divided by the consumer price index, scaled by 100.

Real wage rate: the quantity of goods and services the money wage rate will buy.

Recession: decline in economic activity, often defined as two consecutive quarters of negative growth in real GDP.

Recessionary gap: a measure of the amount by which actual GDP is less than potential GDP.

Regression line: representation of the average relationship between two variables in a scatter diagram.

Required reserve ratio: a legal minimum ratio of cash reserves to deposits.

Reserve ratio (*rr*): the ratio of cash reserves to deposit liabilities held by banks.

Saving function: planned saving at each level of income.

Scatter diagram: a plot of pairs of values simultaneously observed for two variables.

Short side of the market: determines outcomes at prices other than the equilibrium.

Short run: a time frame in which factor prices, supplies of factors of production, and technology are fixed by assumption.

Short-run equilibrium output: Aggregate expenditure equals current output.

Slope of a line: ratio of the change in the value of the variable measured on the vertical axis to the change in the value of the variable measured on the horizontal axis (i.e.: rise/run).

Solow residual: the growth in real GDP or per capita real GDP not caused by growth in factor inputs, but attributed to improved technology.

Standard of deferred payments: the units in which future financial obligations are measured.

Steady state: when output, capital, and labour grow at the same rate.

Store of value: an asset that carries purchasing power forward in time for future purchases.

Structural budget balance (*SBB*): the government budget balance at potential output.

Structural primary government balance (*SPBB*): the difference between net tax revenue at *YP* and government program expenditure. It excludes interest payments on the public debt and the effect of output gaps.

Structural unemployment: caused by changes in economic structure relative to labour characteristics.

Substitute goods: when a price reduction (rise) for a related product reduces (increases) the demand for a primary product, it is a substitute for the primary product.

Substitution effect: the change in net exports caused by a change in relative national prices.

Supply: the quantity of a good or service that sellers are willing to sell at each possible price, with all other influences on supply remaining unchanged.

Supply curve: a graphical expression of the relationship between price and quantity supplied, with other influences remaining unchanged.

Tariff: a tax on an imported product that is designed to limit trade in addition to generating tax revenue. It is a barrier to trade.

Taylor rule: central bank interest rate settings based on inflation and output targets.

Terms of trade: the rate at which goods trade internationally.

Theory: a logical view of how things work, and is frequently formulated on the basis of observation.

Time series: a set of measurements made sequentially at different points in time.

Token money: convertible claims on commodity money.

Total factor productivity (*TFP*): output relative to the combined inputs of labour and capital, the total factor inputs to production.

Trade subsidy: a payment to a domestic manufacturer that reduces domestic prices and limits imports.

Transmission mechanism: links money, interest rates, and exchange rates through financial markets to output and employment and prices.

Unemployment: number of adults not working but actively looking for work.

Unit of account: the standard in which prices are quoted and accounts are kept.

Value added: the difference between the market value of the output of the business and the cost of inputs purchased from other businesses.

Variables: measures that can take on different values.

Very long run: the time required for changes to occur in the stock of capital, the size of the labour force, and the technology of production.

Wealth effect: the change in expenditure caused by a change in real wealth.

Wholesale deposits: large denomination short term 30-day and 60-day deposits that pay higher interest rates than retail deposits.

Yield on a bond: the coupon plus any capital gain or loss from the change in price between the date of purchase and the date of maturity.

Yield on a bond: the return to a bond holder expressed as an annual percentage.

Basic symbol

A – amortization
AD – aggregate supply
AS – aggregate demand
$\mathbf{a_i}$ – manufacture factors (workforce, capital, ground, enterprise abilities)
B – cycle budget
$\mathbf{B_A}$ – actual budget
$\mathbf{B_C}$ –cycle budget
$\mathbf{B_S}$ – structure budget
b – accelerator
C – consumption expenditure
CB – currency backlogs (gold and foreign currency)
CC – cashes are in circulation
CCB – credits of commercial banks
CG – credits of government
CRCB – credit resources of commercial bank
Ca – a sum of costs of commodities which are sold on an account
Cr – a sum of costs of commodities, that realization is subject
C_0 – autonomous consumption
c – average propensity to consume
c' – marginal propensity to consume
D – dividends
DCB – deposits of commercial banks
DG – deposits of government
DI – derive income
d – population deposits
E – export
ES – economic system
G – public expenditure
GDP– gross domestic product
GIP – gross internal product
GNP – gross national product
GPC – gross product of capital
g – rate of increasing of a manufacture efficiency under the influence of technological progress
H – monetary base
I – investments
I_g – gross private investments
I_n – net investments
IDL – international division of labour
IT – inflationary tax
i – percent (interest rate)
i’ – liquid trap

IL – inflation level
Inf – inflation
k – capital capacity
L – quantity engage in production
L_A – liquidity of assets
L^D – labour demand
L^S – labour supply
M – monetary supply (stock)
M_1 – operating monetary demand
M_2 – speculative demand
$M^D(i)$ – demand on money as realty ore speculative
M^S – monetary supply
m – multiplier
m_D – deposit multiplier
m_G – multiplier of the government spending
m_m – money multiplier
m_T – tax multiplier
MHE – money of high efficiency
NCE – net capital export
NE – net export
NEW – net economical wealth
NI – national income
NIR – nominal interest rate
NNP – net national product
P – price level
Pc – payments, the term of payment of which came
PI – personal income
p – payments which are paid
Q - produce volume
Q_F – potential GNP
q – limit propensity to export
R – rent
Rb – nominal income rate on bonds
Re – market income value on stocks
RIR – real interest rate
Rl – level of labour resources
ΔR – saldo of currency funds account
r – delay between reception and usage of money resources
rb – minimum bank backlogs
S – saving
SE – seniorage
SR – stock rate
s – saving rate
s' – marginal propensity to saving
T – tax incoming

$T(Y)$ – tax rate
$T'(Y)$ – marginal tax rate
$T(\tilde{Y})$ – average tax rate
Tind – individual taxes
Tn – indirect taxes
Tr – transfers
T.P. – technological progress (or aggregate productivity of manufacture factors)
t_L – rate of population increasing
UR – unemployment rate
Up – unemployed persons
V – velocity of circulation of one monetary item
W – wage
Y – income
Y^V – real quantity national income what goes to the eventual use
Y_F – income in conditions of full employment
y – labor productivity
Z – import
ZB – balance of payments
ΔZB – foreign trade saldo
γ – Okun's parameter
ν – acceleration coefficient
n.m.u. – nominal monetary units

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